

LIBRARY
OF THE
UNIVERSITY
OF ILLINOIS

352.5
M64
1916-20

Digitized by the Internet Archive
in 2015

https://archive.org/details/annualreportofbo1916milw

ST. LOUIS PUBLIC LIBRARY
Reference Dept

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



THE LIBRARY OF THE
NOV 19 1942
UNIVERSITY OF ILLINOIS

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN SIXTEEN

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN

COMPLIMENTS OF

FRED G. SIMMONS

COMMISSIONER OF PUBLIC WORKS

MILWAUKEE, WIS.

1916 REPORT

PLEASE EXCHANGE

NOV 19 1942
UNIVERSITY OF ILLINOIS

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN SIXTEEN

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



THE LIBRARY OF THE
NOV 1 0 1947
UNIVERSITY OF ILLINOIS

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN SIXTEEN

Department of Public Works

FRED G. SIMMONS,
Commissioner of Public Works.

PERCY BRAMAN,
Deputy Commissioner of Public Works
and
Superintendent Bureau of Purchases.

FRANK W. BLODGETT Supt. Bureau of St. Construction and Repair
CHARLES O. DAVIS ..... Supt. Bureau of Street-Sanitation
J. C. PINNEY, JR. ..... Supt. Bureau of Bridges and Public Buildings
GEO. F. STAAL ..... City Engineer, Bureau of Engineering
H. P. BOHMANN ..... Supt. Water Works
WILLIAM H. SCHACHT, JR. ..... Chief Clerk

352.5
M6A
1916-20

ANNUAL REPORT OF THE DEPARTMENT OF PUBLIC WORKS.

Office of

THE DEPARTMENT OF PUBLIC WORKS.

Milwaukee, April, 1917.

To The Honorable Mayor and Common Council of the City of Milwaukee.

Gentlemen: Submit herewith the report of this department for the year 1916 under captions embracing the various bureaus of the department, these reports being over the signature of the bureau heads.

Very truly yours,

FRED. G. SIMMONS,

Commission of Public Works.

Office of

DEPARTMENT OF PUBLIC WORKS,

City of Milwaukee.

March 30th, 1917.

Mr. Fred G. Simmons,

Commissioner of Public Works.

Dear Sir: The annual report of the accounting division of your Department is herewith respectfully submitted. It includes the usual statements of expenditures, receipts, special assessments, list of contracts awarded, etc.

During the year 1916, the assessments for street pavements were spread over a period of five years, or six equal installments. The first installment is payable without interest, the balance with interest at the rate of six per cent. The spreading of these assessments on the tax roll without applications of the property owners is done in accordance with a law passed by the State Legislature. It is interesting to note that only 28 per cent. of these assessments were paid up in full, which the property owner has a right to elect to do. If the experience of 1916 tax collection is a good criterion, then I believe we have solved the problem of the best method of levying said assessments.

The annual report of 1915 was so consolidated and revised that we can show a saving of $318.77 in printing said report over that of 1914. The 1916 report will be on the basis of 1915 report.

During the year 1916, I revised our official advertisements so as to save time in our office and money to the city. The result was a saving of $1,168.36 in our official advertising.

Respectfully submitted,

WM. H. SCHACHT, JR.,

Chief Clerk.

Accounting Division

Statement of Net Expenditures for the Year Ending December 31, 1916, of the

DEPARTMENT OF PUBLIC WORKS,

Divided According to its Bureaus.

GENERAL ADMINISTRATION.

Administration—		
Salaries—Commissioner, etc	$ 12,479.88	$ 1,800.00
Supplies—Office	102.63	
Contract or Open Order Service—Repairs, etc.	29.85	
Fixed Charges—Advertising, etc	2,420.72	
Equipment—Office	58.63	
Miscellaneous Accounts Receivable		90.00
	$ 15,091.71	$ 1,890.00
Audit and Accounts—		
Salaries—Chief Clerk, etc.	$ 7,507.78	$ 16.89
Supplies—Office	386.43	
Contract or Open Order Service—Repairs, etc.	40.75	
Equipment—Office	34.50	
	$ 7,969.46	$ 16.89
Special Assessments—		
Salaries—Chief Assessment Clerk, etc	$ 7,029.34	
Supplies—Office	190.83	
Contract or Open Order Service—Repairs, etc.	18.00	
Equipment—Office	666.95	
Special Funds—O. & W. Streets and Alleys Advertising and Appraisals	997.45	55.00
	$ 8,902.57	$ 55.00

BUREAU OF PURCHASES AND SUPPLIES.

Purchasing—		
Salaries—Chief Clerk, etc.	$ 2,411.38	
Supplies—Office, etc.	214.08	
Contract or Open Order Service—Repairs, etc.	50.15	
Equipment—Office	47.50	
	$ 2,723.11	

Storage of Supplies—		
Salaries—Storekeeper, etc.	$ 2,979.96	
Supplies—Office, etc.	101.53	
Contract or Open Order Service—Repairs, etc.	1,167.12	
Fixed Charges—Insurance, etc.	330.89	
Equipment—Office	31.48	
Miscellaneous accounts receivable		13.05
	$ 4,610.98	$ 13.05
Storage of Supplies—Special Fund—		
Stores—Stock	$ 50,058.16	$ 46,474.50
	$ 50,058.16	$ 46,474.50

BUREAU OF BRIDGES AND PUBLIC BUILDINGS.

Administration—		
Salary—Superintendent, etc.	$ 12,139.93	$ 3.60
Supplies—Office, etc.	894.34	5.57
Minor Instruments—Drawings, etc.	30.00	
Contract or Open Order Service—Repairs, etc.	467.32	51.58
Equipment—Office, etc.	270.18	
	$ 13,801.77	$ 60.75
Construction—		
Municipal Hospital for Contagious Diseases	$ 54,906.11	
Jackson Street Natatorium	2,358.27	
Fifth Avenue Natatorium	3,454.90	
Engine House No. 32	588.78	
Bridge Yard	10,000.00	
Gordon Park Bridge	5,230.46	
Tower Clock	683.00	
Eighth Ward Public Market	16,400.81	
Second Ward Public Market	60,738.78	
State Street Bridge	12,472.66	
Awnings—City Hall	880.00	
Dining Hall—Blue Mound Sanitorium	7,735.76	
North Avenue Viaduct	21.52	
Racine Street Viaduct	.38	
	$175,471.43	
Bridges and Viaducts—		
Superintendence—		
Salary—Superintendent	$ 1,800.00	
Supplies—Fuel, etc.	169.40	
Contract or Open Order Service—Repairs, etc.	213.53	
Equipment—Motor Vehicle, etc.	10.40	
Miscellaneous accounts receivable		.51
	$ 2,193.33	$ .51

Maintenance—		
Salaries—Ironworkers, etc.	$ 16,451.14	$ 2,841.59
Supplies—Fuel, etc.	156.03	
Minor Instruments—Tools, etc.	237.20	
Material—General	7,285.82	1,558.95
Contract or Open Order Service—Repairs, etc.	2,204.92	375.40
Equipment—Live Stock, etc.	200.00	
Special Fund—Bridge Repairs	26,536.20	
Miscellaneous accounts receivable		1,050.19
	$ 53,071.31	$ 5,826.13
Operation—		
Salaries—Bridge Tenders, etc.	$ 79,149.82	
Supplies—Fuel, etc.	2,252.65	$ 16.17
Minor Instruments—Tools, etc.	101.11	
General Material	44.25	
Contract or Open Order Service — Light, Power, etc.	893.63	
Equipment—Household	193.44	
	$ 82,634.90	$ 16.17
City Hall—		
Heat and Power—		
Salaries—Engineer, etc.	$ 11,168.81	$ 25.70
Supplies—Fuel, etc.	11,557.74	
Minor Instruments—Tools, etc.	93.25	
Material—General	1,625.42	19.83
Contract or Open Order Service—Repairs, etc.	2,402.46	
Fixed Charges—Insurance premium	78.37	
Equipment—General	737.39	
	$ 27,663.44	$ 45.53
Electrical Service—		
Salaries—Electrician, etc.	$ 3,677.18	$ 28.57
Supplies, General, etc.	944.12	
Minor Instruments—Tools, etc.	41.96	
Material—General	581.32	94.79
Contract or Open Order Service—Repairs, etc.	15.41	
Equipment—Motor Vehicle	213.00	
Miscellaneous accounts receivable		4.91
	$ 5,472.99	$ 128.27
Janitorial Service—		
Salaries—Custodian, etc.	$ 15,299.28	
Supplies—Cleaning and Disinfecting	629.64	
Contract or Open Order Service—Repairs	.75	
	$ 15,929.67	

Elevator Service—		
Salaries—Elevator Operators, etc.	$ 4,320.00	
Material—General	16.96	
Contract or Open Order Service—Repairs, etc.	1,334.87	
	$ 5,671.83	
Telephone Service—		
Contract or Open Order Service—Telephone Serv.	$ 3,865.34	$ 806.10
	$ 3,865.34	$ 806.10
General Service—		
Salaries—Watchman, etc.	$ 1,800.00	
Supplies—General	237.42	
Minor Instruments—Tools, etc.	44.94	
Material—General	160.66	$ .25
Contract or Open Order Service—Repairs, etc.	6,814.43	
	$ 9,057.45	$ .25
Markets—		
Central Market—		
Salaries—Market Master	$ 900.00	
Supplies—Fuel, etc.	34.73	
Material—General	.05	
Contract or Open Order Service—Repairs, etc.	1,183.15	
Equipment—General	18.15	
Miscellaneous accounts receivable		10.10
	$ 2,136.08	$ 10.10
Natatoria—		
Center Street Natatorium—		
Salaries—Superintendent, etc.	$ 3,718.06	
Supplies—Fuel, etc.	957.18	
Minor Instruments—Tools, etc.	36.65	
Material—General	54.86	
Contract or Open Order Service—Repairs, etc.	2,544.30	
Fixed Charges—Insurance, etc.	51.07	
	$ 7,362.12	
Jackson Street Natatorium—		
Salaries—Natatorium Assistants, etc.	$ 2,598.63	
Supplies—Fuel, etc.	897.26	
Minor Instruments—Tools, etc.	82.17	
Material—General	21.74	
Contract or Open Order Service—Repairs, etc.	1,015.61	
Fixed Charges—Insurance, etc.	48.57	
Equipment—Office	2.50	
	$ 4,666.48	

Greenbush Street Natatorium—			
Salaries—Superintendent, etc.	$ 4,040.00		
Supplies—Fuel, etc.	1,202.15		
Minor Instruments—Tools, etc.	7.95		
Material—General	21.42		
Contract or Open Order Service—Repairs, etc.	1,995.69		
Fixed Charges—Insurance, etc.	60.58		
	$ 7,327.79		
Greenfield Avenue Natatorium—			
Salaries—Superintendent, etc.	$ 3,740.30		
Supplies—Fuel, etc.	1,207.43		
Minor Instruments—Tools, etc.	11.97		
Material—General	45.46		
Contract or Open Order Service—Repairs, etc.	1,230.63		
Fixed Charges—Insurance, etc.	51.07		
	$ 6,286.86		
North Avenue Natatorium—			
Salaries—Superintendent, etc.	$ 4,460.00		
Supplies—Fuel, etc.	912.68		
Minor Instruments—Tools, etc.	9.17		
Material—General	49.65		
Contract or Open Order Service—Repairs, etc.	2,367.40		
Fixed Charges—Insurance, etc.	60.58		
Miscellaneous accounts receivable		$	388.34
	$ 7,859.48	$	388.34
Prairie Street Natatorium—			
Salaries—Superintendent, etc.	$ 3,705.96		
Supplies—Fuel, etc.	1,613.20		
Minor Instruments—Tools	2.88		
Material—General	12.77		
Contract or Open Order Service—Repairs, etc.	2,476.50		
Fixed Charges—Insurance, etc.	60.58		
	$ 7,871.89		
Bathing Beaches—			
McKinley Park Bath House—			
Salaries—Superintendent, etc.	$ 4,531.56		
Supplies—Fuel, etc.	326.83		
Minor Instruments—Tools, etc.	9.36		
Material—General	20.46		
Contract or Open Order Service—Repairs, etc.	682.22		
Fixed Charges—Bond, etc.	5.00		
Miscellaneous accounts receivable		$	250.00
	$ 5,575.43	$	250.00

South Shore Park Bath House—		
Salaries—Superintendent, etc.	$ 3,545.91	
Supplies—Fuel, etc.	125.78	
Minor Instruments—Tools, etc.	13.25	
Material—General	20.48	
Contract or Open Order Service—Repairs, etc.	715.67	
Fixed Charges—Bond, etc.	5.00	
Miscellaneous accounts receivable		$ 1.50
	$ 4,426.09	$ 1.50
Comfort Stations—		
First Avenue Viaduct—		
Supplies—Fuel, etc.	$ 62.73	
Material—General	2.80	
Contract or Open Order Service—Gen. Service, etc.	413.17	
	$ 478.70	
Street Lighting—		
Contract or Open Order Service—Repairs	$ 71.57	$ 28.81
Equipment—General	3.23	
Miscellaneous	2,616.58	22.47
Electric Light	155,486.62	
Gas Light	71,370.63	
Gasoline Light	7,805.03	
Safety Isles	199.08	
Highland Boulevard	268.10	
Auditorium Square	400.00	
Park Lights	63.00	
Patterns and Development	85.00	
Supplementary Report	234.85	
Demonstration Street Lighting	13,591.29	12.58
Emergency Street Lighting	1,534.49	
	$ 253,729.47	$ 63.86
Illumination Service—		
Construction—		
Salaries and Material	$ 68,083.39	$ 57.61
	$ 68,083.39	$ 57.61
Maintenance—		
Salaries—Engineer, etc.	$ 2,730.00	
Supplies—Office, etc.	843.03	
Equipment—General, etc.	14.38	
	$ 3,587.41	

Municipal Garage—		
Remodeling, etc.	$ 12,356.14	
Equipment—General, etc.	719.50	
	$ 13,075.64	

BUREAU OF STREET CONSTRUCTION AND REPAIRS.

Superintendence—		
Salaries—Superintendent, etc.	$ 9,049.88	
Supplies—Office, etc.	1,185.97	
Contract or Open Order Service—Repairs, etc.	474.82	
Equipment—Office	115.03	
Miscellaneous accounts receivable		$ 13.64
	$ 10,825.70	$ 13.64
Testing Laboratory—		
Salaries—Chemist, etc.	$ 2,499.96	
Supplies—Laboratory, etc.	136.99	$ 543.00
Minor Instruments—Apparatus, etc.	20.95	
Contract or Open Order Service—Repairs, etc.	18.35	
Equipment—Laboratory	106.18	
Miscellaneous accounts receivable		$ 93.46
	$ 2,782.43	$ 636.46
Construction—		
Creosoted Block Paving	$ 40,569.98	
Asphalt Paving	151,613.39	
Brick Paving	15,105.97	
Stone Block Paving	10,379.26	
Recut Granite Paving		
Bituminous Concrete Paving	23,009.22	
Concrete Paving	2,498.43	
Sidewalks, Grading, etc.	2,512.30	
Miscellaneous—Inspection—Advertising, etc.	36,541.11	$ 166.24
	$282,229.66	$ 166.24
Contract Retainer—		
Retainer paid	$ 7,381.21	
Interest paid	3,908.34	
	$ 11,289.55	
Pavement Repairs—		
Salaries—Foreman, etc.	$ 9,523.21	
Minor Instruments—Tools, etc.	148.25	
Equipment—Self Propelled Apparatus	15,782.05	
Special Fund	124,696.18	$ 15,870.69
Miscellaneous accounts receivable		$ 2,521.52
	$150,149.69	$ 18,392.21

Repair Shop—		
Salaries—Foreman, etc.	$ 2,975.48	
Supplies—Fuel, etc.	150.27	
Minor Instruments—Tools, etc.	15.05	
Contract or Open Order Service—Livery Hire, etc.	393.79	
Equipment—General	4.00	
	$ 3,538.59	
Miscellaneous Minor Repairs—		
Salaries—Labor	$ 7,981.71	
Material—Highway	14,693.83	$ 17.00
Contract or Open Order Service—Team Hire	6,108.53	
	$ 28,784.07	$ 17.00
Sidewalk Repairs and Replacements—		
Salaries—Labor, etc.	$ 10,194.10	
Supplies—General, etc.	490.64	
Minor Instruments—Tools, etc.	79.34	
Material—Highway	6,422.94	
Contract or Open Order Service—Team Hire, etc.	2,920.62	$ 430.46
	$ 20,107.64	$ 430.46
Rotary Fund—		
Salaries—Labor	$ 4,948.41	$ 661.00
Miscellaneous accounts receivable		$ 3,251.70
	$ 4,948.41	$ 3,912.70
Track Elevation and Depression—		
Special Fund	$ 30,209.52	
Miscellaneous accounts receivable		$ 3,363.84
	$ 30,209.52	$ 3,363.84

BUREAU OF STREET SANITATION.

Superintendence—		
Salaries—Superintendent, etc.	$ 4,448.92	
Supplies—Office, etc.	409.71	
Contract or Open Order Service—Motor Vehicle Rep., etc.	104.84	
Fixed Charges—Advertising, etc.	21.18	
	$ 4,984.65	
Field—		
Salaries—Supervisors, etc.	$ 31,017.25	
	$ 31,017.25	

Street Cleaning—		
Salaries—Labor, etc.	$106,064.86	
Supplies—General	153.05	$ 10.71
Minor Instruments—Tools, etc.	1,550.59	
Contract or Open Order Service—Team Hire, etc.	46,649.11	
Equipment—Self Propelled Apparatus	7,979.69	
Miscellaneous accounts receivable		$ 15.25
	$162,397.30	$ 25.96
Removing Snow from Streets—		
Salaries—Labor, etc.	$ 20,349.20	
Supplies—General	577.52	
Minor Instruments—Tools, etc.	128.95	
Material—Highway	19.00	
Contract or Open Order Service—Team Hire, etc.	8,149.37	
Equipment—Horse-drawn Apparatus	624.23	
Miscellaneous accounts receivable		$ 4.23
	$ 29,848.27	$ 4.23
Collection of Ashes and Rubbish—		
Salaries—Labor, etc.	$ 98,212.82	
Supplies—Office, etc.	4.55	
Minor Instruments—Tools, etc.	363.54	
Contract or Open Order Service—Team Hire, etc.	124,538.20	
Miscellaneous accounts receivable		$ 47.30
	$223,119.11	$ 47.30
Garbage Collection—		
Salaries—Superintendent, etc.	$ 2,028.71	
Supplies—Motor Vehicle, etc.	322.74	
Material—General	.76	
Contract or Open Order Service—Team Hire, etc.	117,510.17	
Fixed Charges—Auto Lincense	5.00	
Equipment—Horse-drawn Vehicles	156.25	
Miscellaneous accounts receivable		$ 300.00
	$120.023.63	$ 300.00
Removal of Dead Animals—		
Contract or Open Order Service—Team Hire, etc.	$ 1,767.50	
Miscellaneous accounts receivable		$ 91.33
	$ 1,767.50	$ 91.33

Cleaning Catch Basins—		
Salaries—Labor, etc.	$ 12,095.28	
Supplies—General	186.64	
Minor Instruments—Tools, etc.	36.51	
Contract or Open Order Service—Team Hire, etc.	9,886.83	
	$ 22,205.26	
Sprinkling, Flushing and Oiling—		
Salaries—Superintendent, etc.	$ 25,314.23	
Supplies—Horse-drawn apparatus, etc.	4,930.63	
Minor Instruments—Tools, etc.	177.58	
Material—Highway	87,807.05	
Material—General	273.13	
Contract or Open Order Service—Team Hire, etc.	96,079.11	
Fixed Charges—Rent, etc.	10,132.75	
Equipment—Self Propelled	18,868.90	
Miscellaneous accounts receivable		$ 890.47
	$243,583.38	$ 890.47
Ward Yards—		
Salaries—Labor	2,551.27	
Supplies—General, etc.	306.68	
Minor Instruments—Tools, etc.	83.85	
Material—General	331.78	
Contract or Open Order Service—Team Hire, etc.	799.94	
Fixed Charges—Rent, etc.	680.00	
Sewer and Water Connections	92.29	
Street End Barricade	367.44	
	$ 5,213.25	

BUREAU OF SEWERS.

Administration—		
Salaries—Superintendent, etc.	$ 6,742.73	
Supplies—Office, etc	507.65	
Minor Instruments—Tools, etc.	.50	
Contract or Open Order Service—Repairs, etc.	264.73	
Fixed Charges—Auto License	5.00	
Equipment—Office, etc.	26.25	
Miscellaneous accounts receivable		14.00
	$ 7,546.86	$ 14.00

Store Yards—		
Salaries, Labor, etc.	$ 4,176.65	
Supplies—Forage and Veterinary, etc.	1,550.42	
Contract or Open Order Service—Repairs, etc.	821.14	
Equipment—Live Stock	250.00	
Miscellaneous accounts receivable		265.98
	$ 6,798.21	$ 265.98
Cleaning and Flushing—		
Salaries—Labor, etc.	$ 10,716.19	
Supplies—General, etc.	282.26	
Material—General	55.63	
Contract or Open Order Service—Team Hire, etc.	5,399.82	
Fixed Charges—Rent	3,681.00	
Equipment—General	2,591.69	
Miscellaneous accounts receivable		1,772.80
	$ 22,726.59	$ 1,772.80
Repairs—		
Salaries, Labor, etc.	$ 5,093.80	
Material—Sewer	1,153.05	
Contract or Open Order Service—General Service	226.17	
Miscellaneous accounts receivable		$ 257.25
	$ 6,473.02	$ 257.25
Conctruction—City—		
Salaries—Labor, etc.	$ 41,978.40	
Material—Sewer, etc.	41,876.99	
Contract or Open Order Service—Team Hire, etc.	6,504.10	
Supplies—General, etc.	470.05	
Miscellaneous	121.41	
Miscellaneous accounts receivable		1,851.81
	$ 90,950.95	$ 1,851.95
Construction—Contract—		
Salaries—Inspection	$ 10,302.25	
Advertising	214.68	
Concrete Sewer	158,158.72	
Pipe Sewer	64,060.69	
	$232,736.34	

BUREAU OF RIVERS AND HARBORS.

Harbor Commission—		
Salaries—Secretary	$ 1,800.00	
Supplies—Office	16.60	
Contract or Open Order Service—Postage, etc.	23.24	
Fixed Charges—Publications	321.88	
	$ 2,161.72	
Harbor Master—		
Salaries—Harbor Master	$ 999.96	
Supplies—Motor Vehicle	28.78	
Contract or Open Order Service—Repairs, etc.	75.47	
	$ 1,104.21	
Docking and Dredging—		
Salary—Inspection	$ 1,281.00	
Dredging	34,317.76	
Harbor Improvements	6,468.70	
	$ 42,067.46	

MISCELLANEOUS.

House Drains and Water Connections—		
Salaries—Inspection	$ 2,038.00	$ 32.80
Connections	35,505.54	
	$ 37,543.54	$ 32.80
City Property—		
Rents received		$ 7,910.20
		$ 7,910.20

List of Contracts

Awarded by

the

Department of Public Works

During the Year 1916

LIST OF CONTRACTS AWARDED BY THE DEPARTMENT OF PUBLIC WORKS DURING 1916.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
7	Jan. 31, 1916....	White Construction Co.	15 tons asphaltic cement	$ 337.50
9	Feb. 4, 1916....	Gumz, Gutknecht & Wussow.....	Cut., hard sandstone, str. curb, reset, Jackson St., from Wisconsin St. to Michigan St.	5,127.26
10	Feb. 4, 1916....	Gumz, Gutknecht & Wussow.....	Cut., hard sandstone, str. curb, reset, Van Buren St., from Wisconsin to Michigan St.	5,267.05
11	Feb. 4, 1916....	Gumz, Gutknecht & Wussow.....	Cut., hard sandstone, reset, Jefferson St., from Wisconsin to Michigan St.	6,302.22
12	Feb. 4, 1916....	Badger Construction Co.	Bit. concrete, curb and gutter, sidewalk, Louis Ave., from Davis St. to 60 ft. N. of Nash St.	5,846.58
13	Feb. 4, 1916....	John Weiher	Cut., bit. concrete, curb and gutter, sidewalks, Concordia Ave., from 26th to 27th St.	2,026.13
14	Feb. 4, 1916....	John Weiher	Cut., flg., bit. concrete, brick gutter, str, curb, sidewalks, Hadley St., from Fond du Lac Ave. to 30th St.	897.94
15	Feb. 4, 1916....	John Weiher	Cut., brick paving, alley Blk. 15, Ludington's Add., bet. 18th, 19th, Center and Hadley Sts., 20th Ward	2,182.84
16	Feb. 4, 1916....	Paul C. Kroeck	Cut., brick paving, alley Blk. 63, 3rd Ward, bet. Milwaukee, Biddle, Oneida Sts., and Broadway	1,222.74
17	Feb. 5, 1916....	Badger Construction Co.	Cut., asphalt, curb and gutter, sidewalks, 25th St., from Franklin St. to Pease St.	3,970.67

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
18	Feb. 5, 1916....	Badger Construction Co.	Cut., asphalt, brick gutter, str. curb, rad. curb, reset, Hopkins St., from Chambers to Teutonia—Chambers, from 17th to Hopkins—Janke Pl., from Hopkins to Locust—Locust St., from Janke Pl. to Hopkins St.	9,488.08
19	Feb. 5, 1916....	Badger Construction Co.	Cut., flg., asphalt, curb and gutter, sidewalks, 26th St., from Pease St. to Franklin St.	4,134.23
20	Feb. 5, 1916....	F. P. Caughlin Co.	Cut., asphalt, cement gutter, cement curb and gutter, Finn Pl., from 11th St. to 12th St.	2,329.77
21	Feb. 5, 1916....	F. P. Caughlin Co.	Asphalt, curb and gutter, sidewalks, 14th St., Davis to Nash..	8,785.93
22	Feb. 5, 1916....	F. P. Caughlin Co.	Cut., flg., asphalt, brick gutter, str. curb, rad. curb, reset, Knapp St., from Astor St. to Jackson St.	16,031.53
23	Feb. 5, 1916....	F. P. Caughlin Co.	Cut., flg., asphalt, curb and gutter, sidewalks, Weil St., from Burleigh St. to Auer Ave.	7,159.07
24	Feb. 5, 1916....	F. P. Caughlin Co.	Cut., light asphalt, cement gutter, curb and gutter, sidewalks, Auer Ave., from 1st to Achilles St.	1,579.63
25	Feb. 5, 1916....	White Construction Co.....	Cut., light asphalt, brick gutter, straight sandstone curb, radius sandstone curb, sidewalks, 24th Ave., Harrison to Cleveland	6,027.18
26	Feb. 5, 1916....	White Construction Co.....	Cut., flg., light asphalt, brick gutter, sand. curb, sidewalks, 24th Ave., from Becher to Lincoln Ave.	11,294.71
8	Jan. 31, 1916....	Western Lime & Cement Co.....	10,000 barrels Portland cement	20,500.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
35	Feb. 15, 1916....	F. P. Caughlin Co.	Cut., standard asphalt, brick gutter, curb and gutter, Prospect Ave., from Bradford to Park	$ 9,569.32
36	Feb. 15, 1916....	F. P. Caughlin Co.	Cut., standard asphalt, cement gutter, curb and gutter, Bradford Ave., from Prospect Ave. to Downer Ave.	4,319.77
37	Cancelled.			
38	Feb. 15, 1916....	Badger Construction Co.	Cut., flg., light asphalt, cement gutter, curb and gutter, 8th St., from Atkinson to Graham	3,015.05
39	Feb. 15, 1916....	White Construction Co.	Cut., flg., light asphalt, curb and gutter, Hayes Ave., from Forest Home to 26th Ave.	6,649.62
40	Feb. 15, 1916....	White Construction Co.	Cut., flg., light asphalt, cement curb and gutter, Arthur Ave., from Layton Blvd., to 26th Ave.	6,996.93
41	Feb. 16, 1916....	White Construction Co.	Cut., flg., light asphalt, curb and gutter, 26th Ave., from Lincoln Ave. to Hayes Ave.	4,976.88
42	Feb. 15, 1916....	White Construction Co.	Cut., flg., light asphalt, sidewalks, curb and gutter, 5th Ave., from Cleveland Ave. to right of way of C. & N. W. Ry.....	3,639.79
43	Feb. 15, 1916....	White Construction Co.	Cut., flg., light asphalt, curb and gutter, sidewalks, 7th Ave. from Cleveland Ave. to right of way of C. & N. W. Ry...	3,659.03
44	Feb. 15, 1916....	White Construction Co.	Cut., flg., light asphalt, curb and gutter, sidewalks, American Ave. from Cleveland to R. of W. of C. & N. W. Ry.....	5,584.60
45	Feb. 15, 1916....	White Construction Co.	Cut., light asphalt, curb and gutter, sidewalks, Cleveland Ave., from American to 11th Ave.	2,683.26

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
46	Feb. 15, 1916....	White Construction Co.	Cut., flg., light asphalt, curb and gutter, sidewalks, 29th Ave., from Greenfield Ave. to Lapham St.	$ 7,210.29
48	Feb. 16, 1916....	John Weiher	Cut., sandstone, creosote, str. curb, reset, rad. curb, sidewalks, Humboldt Ave., from North Ave. to Locust St.	57,080.39
49	Feb. 16, 1916....	John Weiher	Bit. concrete, cut., brick gutter, curb, 30th St., from Concordia to Townsend	4,185.73
50	Feb. 16, 1916....	Manger & McGucken	Cut., concrete removed, hard sandstone, brick removed, str. curb, rad. curb, reset, 11th Ave., from National Ave. to end of 16th St. Viaduct, including approach	6,376.19
51	Feb. 16, 1916....	Manger & McGucken	Cut., cresote, str. curb, rad. curb, reset, sidewalks, Center St., from Holton to Humboldt Ave.	16,719.56
52	Feb. 16, 1916....	Milwaukee Gen'l Const. Co.	Cut., str. curb, rad. curb, reset, creosote, sidewalks, Clybourn St., from 27th St. to 35th St.	25,811.16
53	Feb. 19, 1916....	Barrett Mfg. Co.	20,000 gallons road binder	1,600.00
55	Feb. 29, 1916....	Chicago Creosoting Co.	Creosoted blocks, 400 sq. yds. 3½ in., and 3,300 sq. yds. 3 in.	5,105.00
56	Feb. 29, 1916....	White Construction Co.	Cut., flg., bit. concrete, asphalt, str. curb, rad. curb, reset, brick gutter, 19th Ave., from Greenfield to Rogers.....	27,141.28
57	Mar. 3, 1916....	P. C. Kroeck	Cut., flg., bit. concrete, curb and gutter, sidewalk, 28th Ave., from Greenfield to Lapham St.	4,984.62
58	Mar. 3, 1916....	Badger Construction Co.	Cut., Bit. concrete, brick gutter, intersection of 46th St. with Wright St. and Clarke St.	791.85

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
59	Feb. 29, 1916....	F. P. Caughlin Co.	Cut., asphalt, brick gutter, str. curb, rad. curb, reset, Kenwood Blvd., from Bartlett to Oakland Ave.	$ 3,725.11
60	Feb. 29, 1916....	F. P. Caughlin Co.	Cut., fig., asphalt, curb and gutter, sidewalks, George St., from Richards St. to N. Pierce St.	11.310.71
61	Feb. 29, 1916....	F. P. Caughlin Co.	Cut., fig., asphalt, curb and gutter, sidewalks, Ring St., from Richards St. to 2nd St.	10,288.90
62	Feb. 29, 1916....	Badger Construction Co.	Cut., asphalt, brick gutter, sandstone curb, radius sandstone curb, 24th Ave., from Forest Home to Harrison Ave.	4,522.25
47	Feb. 18, 1916....	Sterling Motor Truck Co.	One motor oil sprinkler	5,525.00
89	Mar. 10, 1916....	F. P. Caughlin Co.	Cut., fig., asphalt, brick gutter, str. sandstone curb, rad. sandstone curb, sidewalks, Keefe Ave., from Humboldt Ave. to Pt. Washington Road	74,807.10
90	Mar. 10, 1916....	F. P. Caughlin Co.	Cut., fig., concrete paving, asphalt, brick gutter, str. curb, rad., reset, sidewalks, Concordia Ave., from Booth to Humboldt, and North Pierce, from Concordia to Concordia	14,818.23
92	Mar. 10, 1916....	White Construction Co.	Cut., fig., asphalt removed, asphalt, brick gutter, curb rem., reset, radius, sidewalks rem., brick paving, roadway, 3rd Ave., from Windlake to Maple—Maple, from 3rd to Windlake;— W. ½ of Windlake, from 3rd to Maple, also the triangle inc. between these streets	3,997.92

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
93	Mar. 10, 1916....	White Construction Co.	Cut., asphalt, brick gutter, str. curb, rad., reset, 16th Ave., from Maple to Greenfield; Maple, Muskego to 16th.....	$ 22,459.90
94	Mar. 10, 1916....	Badger Construction Co.	Cut., flg., asphalt, brick gutter, cement curb, str. curb, rad. curb, reset, sidewalks, Center St., from Fond du Lac to 30th St., and from 32nd to 36th, and from 39th to Sherman Blvd.	37,096.82
95	Mar. 10, 1916....	Badger Construction Co.	Cut., asphalt, brick gutter, str. curb, rad. curb, Hopkins St., from Keefe Ave. to 27th st.	3,359.84
96	Mar. 10, 1916....	White Construction Co.	Cut., asphalt, brick gutter, str. curb, rad., reset, 21st Ave., from Lincoln Ave. to Rogers St.	21,559.72
97	Mar. 10, 1916....	Badger Construction Co.	Asphalt, comb. cement curb and gutter, sidewalks, Greenfield Ave., from 31st Ave. to Trowbridge	9,002.95
98	Mar. 10, 1916....	Badger Construction Co.	Asphalt, brick gutter, str. sandstone curb, rad. sandstone curb, sidewalks, North Ave., from 48th to 53rd, ext. N.....	20,423.39
99	Mar. 10, 1916....	Badger Construction Co.	Asphalt, cement curb and gutter, cement curb, sidewalks, Sherman Blvd., from Wright St. to Center St.	18,388.42
100	Mar. 10, 1916....	Badger Construction Co.	Cut., flg., asphalt, curb and gutter, sidewalks, 14th Ave., from Hayes Ave. to Arthur Ave.	6,392.72
101	Mar. 10, 1916....	Badger Construction Co.	Cut., flg., asphalt, 22nd St., Hopkins to Keefe Ave.	9,411.94
102	Mar. 10, 1916....	Badger Construction Co.	Cut., flg., asphalt, curb and gutter, cement gutter, sidewalks, Elm St., from 49th St. to 50th St.	3,522.84

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
103	Mar. 13, 1916....	Emil Wolfgram	Cut., fig., Sherman Blvd., from Wright to Center, and North Ave., from 48th to 53rd, extended north	$ 5,260.89
104	Mar. 13, 1916....	Paul C. Kroeck	Cut., fig., bit. concrete, curb and gutter, sidewalks, 33rd St., from Bureligh St. to Climax Subd.	6,993.92
105	Mar. 13, 1916....	Manger & McGucken	Cut., fig., brick pvg., str. curb, rad. curb, sidewalks, Locust St., from 29th to Fond du Lac Ave.	9,295.58
106	Mar. 13, 1916....	Paul C. Kroeck	Cut., fig., bit. concrete, brick gutter, str. curb, rad. curb, reset, sidewalks, Deer Pl., from Howell Ave. to West St.	7,165.15
107	Mar. 13, 1916....	Paul C. Kroeck	Cut., fig., bit. concrete, curb and gutter, sidewalks, Pennsylvania Ave., from Beulah to city limits. New York Ave., from Delaware Ave. to city limits; Meredith St., from Northwestern Ave. to Oklahoma Ave., etc.	29,802.82
139	Mar. 27, 1916....	Andrew Huber	Curb and gutter, sidewalks, 50th St., from Vliet to Washington Blvd.; 51st St., from Vliet to Washington Blvd., Pabst Ave., from 52nd to 56th St.; Vine St., from 52nd to 55th St.	6,352.12
140	Mar. 27, 1916....	Badger Construction Co.	Cut., fig., asphalt, Pabst Ave., 52nd to 56th St.	8,354.32
141	Mar. 27, 1916....	Badger Construction Co.	Cut., fig., asphalt, curb removed, 50th St., from Vliet to Washington Blvd.; 51st St., from Vliet to Washington Blvd.; Vine St., from 52nd to 55th St.	17,823.29
142	Mar. 27, 1916....	F. P. Caughlin Co.	Cut., fig., bit. concrete, asphalt, curb and gutter, sidewalks, Finn Pl., from 12th St. to 17th St.	11,299.17

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
145	Apr. 10, 1916....	Badger Construction Co.	Cut., flg., bit. concrete, 52nd St., Vliet to Washington Blvd.; and 53rd St., Vliet to Washington Blvd.	$..12,059.12
146	Apr. 10, 1916....	White Construction Co.	Cut., flg., asphalt, curb and gutter, sidewalks, 39th St., from Clarke St. to Center St.	4,537.09
147	Apr. 10, 1916....	F. H. Koch	Sidewalks, east side of 27th Ave., Burnham St. to a point 360 feet north of the north line of Burnham St.	196.84
152	Apr. 10, 1916....	Gumz, Gutknecht & Wussow	Flg., cedar blk. rem., creosote, limestone curb, reset, Walnut St., from 4th to 7th St.	8,590.20
153	Apr. 10, 1916....	Dean Construction Co.	Cut., bit. concrete, curb and gutter, sidewalks, Harrison St., Hanover to Greenbush; Hanover St., Harrison St. to Reserved Lot V.	6,571.57
154	Apr. 10, 1916....	Manger & McGucken	Cement concrete pavement, drain tile, 10th Ave., from Cleveland Ave. to R. O. W. of C. & N. W. Ry Co.	2,117.73
155	Apr. 10, 1916....	John Unger	Curb and gutter, sidewalks, 52nd St., from Vliet to Washington Blvd.; 53rd St., from Vliet to Vine St.	5,870.16
156	Apr. 10, 1916....	Manger & McGucken	Cut., brick paving, south alley rng. E. and W., Blk. 4, Edgewood, bet. 34th, 35th, Wells and Cedar Sts., 16th Ward....	1,122.26
157	Apr. 10, 1916....	Dean Construction Co.	Cut., brick paving, alley bet. Lapham, Mitchell, Clinton and Reed, 12th Ward	2,993.15
158	Apr. 10, 1916....	Dean Construction Co.	Cut., flg., cobblestone paving removed, brick paving, east alley rng. N. and S., Blk. L, subd. of W. ½ of S. W. ¼, Sec. 17, bet. 7th, 8th, Lee and Wright Sts., 7th Ward	2,074.64

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
159	Apr. 10, 1916....	Dean Construction Co.	Cut., brick paving, alley Blk. 2, Badger State Park, Blk. 2, Florence Invest. Co. Subd., 20th Ward, between 21st, 22nd, Chambers and Burleigh Sts.	$ 2,328.06
182	Apr. 28, 1916....	George Czerwinski	Cut., drain tile, concrete paving, alley Blk. 5, Washington Park Hts. and Blk. 2 Cont. of Hi-Mount, 19th Ward, bet. 51st, 52nd, Vine Sts. and Pabst Ave.	1,290.98
183	Apr. 28, 1916....	George Czerwinski	Cut., flg., drain tile, concrete paving, Alley Blk. 7, Pierce and Davis Addn., bet. 7th, 8th, Ring Sts. and Concordia Ave.	959.35
184	Apr. 28, 1916....	Dean Construction Co.	Cut., flg., sidewalks, Louis Ave., from Atkinson Ave. to St. George Hts.; 11th St., from Atkinson to Williamsburg Hts.; 12th St., from Atkinson Ave. to St. George Hts.....	2,027.24
185	Apr. 28, 1916....	Frank Banaszak	Cut., flg., sidewalks, Orchard Pl., from 27th to 28th Ave.; 31st Ave., from Lapham to Greenfield; 32nd Ave., from Greenfield to Orchard Pl.	3,295.90
190	May 10, 1916....	John S. O'Neil	Bit. concrete, curb and gutter, sidewalks, 44th and 45th Sts., from Vliet to Chestnut	8,962.54
191	May 10, 1916....	George Czerwinski	Cut., drain tile, concrete, alley rng. E. and W., bet. 11th, 12th, Davis Sts. and Finn Pl., 25th Ward	706.51
192	May 10, 1916....	Manger Construction Co.	Cut., flg., brick paving, alley rng. N. and S., Blk. 11, Milw. S. & I. Assn. Sub. No. 2, bet. 11th, 12th, Ring and Concordia Ave., 25th Ward	1,910.36

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
193	May 10, 1916....	Badger Construction Co.	Cut., asphalt, brick gutter, sandstone curb, rad. sand. curb, sidewalks, Vliet St., from Hawley Road to west city limits	$ 1,884.61
194	May 10, 1916....	Badger Construction Co.	Cut., asphalt, curb and gutter, Bradford Ave., from Lake Drive to Downer Ave.	1,538.03
207	May 26, 1916....	John S. O'Neill	Bit. concrete, curb and gutter, sidewalks, 17th St., from Ring St. to Schwartz' Subd.	5,342.63
208	May 26, 1916....	Milwaukee Gen'l Const. Co.	Cut., flg., sidewalks, 2nd, 3rd, 4th, Midland, 5th, 6th, 7th, 9th, 10th, American Aves., from Oklahoma to Dakota, except Lot 1, Block 3, Vogel's Park	21,246.17
209	May 26, 1916....	Milwaukee Gen'l Const. Co.	Cut., flg., drain tile, concrete paving, alley Blk. 11, Trowbridge Park Cont., bet. 24th, 25th, Becher and Rogers, 24th Wd.	1,904.64
210	May 26, 1916....	F. P. Caughlin Co.	Asphalt, curb and gutter, sidewalks, 17th St., from Davis to Finn	4,362.25
211	May 26, 1916....	Henry Hase	Cut., flg., old pavement rem., brick paving, alley Blk. 45, bet. 5th, 6th, State and Prairie Sts.	3,543.69
212	May 26, 1916....	Arthur Froemming	Cut., flg., 17th St., from Davis to Finn Pl., and from Ring to Schwartz' Subd.	1,313.13
213	May 26, 1916....	Dean Construction Co.	Cut., flg., sidewalks, Graham St., from Green Bay to Atkinson; Atkinson, from Graham to 11th; 8th St., from Graham to Williamsburg Hts.; 7th St. from Atkinson Ave. to Green Bay Ave.	4,602.65

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
217	June 14, 1916....	John S. O'Neill	Cut., brick gutter, bit. concrete, sandstone curb, rad. sand. curb, driveway around North Point Water Tower, between Terrace Ave and Lake Drive	$ 4,025.76
218	June 14, 1916....	John S. O'Neill	Cut., flg., bit. concrete, curb and gutter, sidewalks, Galena St., from 49th to 51st St.	2,788.15
228	June 23, 1916....	F. P. Caughlin Co.	Cut., asph. rem., asphalt, brick gutter, curb and gutter, curb and gutter rem., rad. concrete curb, Kenwood Blvd., from Downer to Lake Drive	21,388.93
229	June 28, 1916....	George Czerwinski	Creosote, str. curb, reset, cut., rad., Chestnut St., from 12th to 18th St.	28,194.71
230	June 23, 1916....	Manger Construction Co.	Cut., sandstone curb, rad. sandstone curb, brick paving, 11th St., from Clybourn St. to Grand Ave.	6,207.91
231	June 23, 1916....	Manger Construction Co.	Cut., old pvmt. rem. brick paving, Alley, 15th Ward, bet. 24th, 25th, Cedar and State Sts.	1,078.94
232	June 23, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete paving, alley bet. 22nd, 23rd, Clarke and Center Sts.	2,500.50
233	June 23, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete paving, alley bet. 36th, 37th, Brown Sts. and Lisbon Ave., 19th Ward	1,894.93
234	June 23, 1916....	Manger Construction Co.	Cut., brick paving, alley in Blk. 3, Foster & Brand's Sub., Blk. 2, Newberry Hill and Blk. 2, Cont. of Newberry Hill, 18th Ward, bet. Folsom, Linnwood, Cramer and Oakland.....	2,445.73

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
235	June 23, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete paving, alleys bet. Newhall, Bartlett, Concord and Kenwood; Oakland, Bartlett, Concord and Kenwood; Newport, Hartford, Oakland and Bartlett; Bartlett, Newhall, Hartford and Concord.....	$ 4,489.24
236	June 26, 1916....	Walter E. Lippmann	Repaving gutter, str. curb, reset, St. Paul Ave., from 27th St. to 35th St.	1,172.51
237	June 23, 1916....	Paul C. Kroeck	Cut., fig., bit. concrete paving, brick gutter, str. curb, rad. curb, reset, sidewalks, Howell Ave., from 4th St. to Oklahoma	4,449.93
238	June 23, 1916....	White Construction Co.	Asphalt, brick gutter, rad. curb, sidewalks, str. curb, Hayes Ave., from Midland to 8th Ave.	10,010.11
243	July 8, 1916....	Frank Banaszak	Cut., fig., sidewalks, Manitoba St., from 1st to 11th Ave., and Dakota St., from 1st Ave. to 11th Ave.	9,722.15
244	July 8, 1916....	Frank Banaszak	Cut., fig., sidewalks, Melvina St., from 19th to 20th	1,026.94
245	July 13, 1916....	George Czerwinski	Cut., fig., brick pavement, alley bet. 7th, 8th, Wells and Cedar	1,086.00
246	Cancelled.			
247	July 13, 1916....	Badger Construction Co.	Pvmt. to be removed, asphalt, brick gutter, str. curb, rad. curb, reset, Jefferson St., from Wisconsin to Mason St.....	5,747.35
248	July 13, 1916....	White Construction Co.	Cut., fig., asphalt, comb. curb and gutter, sidewalks, Mitchell St., from 27th Ave. to 126.50 west of W. L. of 27th Ave.....	949.17
249	July 13, 1916....	Milwaukee Gen'l Const. Co.	Cut., fig., old pvmt. removed, creosote, N. ½ of alley rng. N. and S., and the W. ½ of alley rng. E. and W., bet. 2nd, 3rd, Sycamore Sts and Grand Ave.	2,107.35

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
250	July 13, 1916....	John S. O'Neill	Cut., fig., bit. concrete, curb and gutter, sidewalks, Western Ave., from Greenfield to Lapham	4,957.18
251	July 13, 1916....	John S. O'Neill	Cut., fig., sidewalks, W. side of Louis Ave., from Atkinson to 180 ft. S. of Lake St.	907.62
252	July 13, 1916....	Theo. C. Froemming	Cut., fig., Humboldt Ave., from Jefferson to Lake St.	2,804.27
253	July 20, 1916....	John S. O'Neill	Bit. concrete, curb and gutter, ce. curb and gut., reset, sidewalks raised, sidewalks, Layton Blvd., from Greenfield to Lincoln	17,038.52
255	July 25, 1916....	John S. O'Neill	Cut., fig., sidewalks, Nash St., from Louis Ave., to 17th St., and W. 19th St., from Franklin to Atkinson Ave.	4,312.15
256	July 25, 1916....	Paul C. Kroeck	Cut., concrete paving, drain tile, alley bet. 25th, 26th, Chestnut and Prairie Sts., 15th Ward	1,217.75
257	July 25, 1916....	Paul C. Kroeck	Cut., fig., concrete paving, drain tile, alley rng. E. and W., bet. 9th and 10th, Davis Sts. and Atkinson Ave., 25th Ward....	667.05
258	July 25, 1916....	Paul C. Kroeck	Cut., fig., cement concrete pvg. drain tile, alley in blk. bet. Island Ave., 1st, Locust and Chambers Sts.	2,026.25
259	July 25, 1916....	Paul C. Kroeck	Cut., cement concrete pvg., drain tile, all alleys in blk. bet. 33rd, 34th, North and Meinecke Aves, 22nd Ward	1,373.61
260	July 25, 1916....	Milwaukee Gen'l Const. Co.	Cut., cem. concrete pvg., drain tile, E. and W. alley, bet. American, 11th Aves., Lapham and Odell Sts., 8th Ward	584.93
261	July 25, 1916....	Wisconsin Cement Const. Co.	Cut., fig., cement concrete pvg., drain tile, all alleys bet. 12th, and Davis Sts., Louis and Concordia Ave., 25th Ward.....	2,884.77

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
262	July 25, 1916....	John Weiher	Cut., flg., bit. concrete pvg., Linebarger Terrace, from Kinnickinnic Ave. to N. line of Lot 15, Blk. 2, G. W. Emmons' Sub.	$ 1,702.77
263	July 25, 1916....	Paul C. Kroeck	Bit. Concrete pvg., Louis Ave., from a point 60 ft. N. of Nash St. to Atkinson Ave.	996.94
264	July 25, 1916....	F. P. Caughlin Co.	Cut., asphalt, Ivanhoe Pl., from North Ave. to Prospect Ave.....	2,169.54
265	July 25, 1916....	Badger Construction Co.	Cut., flg., st. asphalt, brick gutter, str. curb, rad. curb, sidewalks, Lisbon Ave., from North Ave. to city limits	2,199.30
266	July 25, 1916....	George Czerwinski	Cut., creosote block, str. curb, reset, 8th St., from Cedar to Prairie St.	11,472.63
267	July 25, 1916....	C. F. Haworth	Cut., flg., cement sidewalks, Orchard St., from 31st to Trowbridge	1,553.13
268	July 25, 1916....	Frank Banaszak	Cut., flg., sidewalks, Arthur Ave., from 13th to 14th Ave.; Kearney Pl., from 13th to 14th Ave.; east side of 15th Ave., from Lincoln Ave. to Hayes Ave.	1,333.43
269	July 25, 1916....	Fred Hildebrand, Jr., ...	Cut., flg., sidewalks, 27th Ave., from Lincoln to Pilgrim's Rest Cemetery, and Lincoln Ave., from 27th to 28th Ave.....	1,407.73
277	Aug. 9, 1916....	John Weiher	Cut., sandstone, creosote, str. curb, rad. curb, reset, 35th St., from Vliet to Pabst Ave., on west side of St. and to Lloyd St. on East side of St.	23,750.96
278	Aug. 9, 1916....	Paul C. Kroeck	Cut., flg., bit. concrete, curb and gutter, 31st Ave., from Greenfield Ave. to Lapham St.	4,957.78

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
279	Aug. 9, 1916....	Paul C. Kroeck	Cut.,drain tile, cement concrete pvg., S. alley rng. E. and W. in Blk. 2, Tweedy's Subd., 23rd Wd., bet. 27th, 28th, Madison and Scott Sts.	$ 549.08
280	Aug. 9, 1916....	Dean Construction Co.	Cut., creosote, str. curb, rad. curb, reset, Holton St., from Hadley to Bureigh	16,680.68
281	Aug. 9, 1916....	Badger Construction Co.	Cut., asphalt, gutter pvg., str. curb, rad. curb, reset, 8th St., from Germania St. to North Ave.	11,464.46
282	Aug. 9, 1916....	Badger Construction Co.	Cut., asphalt, gutter pvg., str. curb., reset, 15th St., from Cedar to State St.	4,132.42
283	Aug. 9, 1916....	White Construction Co.	Cut., asphalt, gutter pvg., str. curb, rad. curb, reset, Cedar St., from 13th St. to 9th St.	10,956.42
284	Aug. 9, 1916....	Badger Construction Co.	Cut., fig., asphalt, curb and gutter, sidewalks, 14th St., from Nash St. to 400 ft. N. of last named point	3,625.91
285	Aug. 9, 1916....	White Construction Co.	Cut., fig., asphalt, curb and gutter, Becher St., from Layton Blvd. to Muskego Ave.	11,993.86
286	Aug. 9, 1916....	Paul C. Kroeck	Curb and gutter, Louis Ave., from 60 ft. N. of Nash to Atkinson Ave.	207.45
287	Aug. 9, 1916....	C. F. Haworth	Cut., fig., sidewalks, 24th Ave., from Mitchell to Burnham	1,373.25
288	Aug. 9, 1916....	Paul C. Kroeck	Cut., fig., sidewalks, Middlemass St., from Dunlop to alley rng. N. W.ly and S. E.ly	730.73
289	Aug. 9, 1916....	Paul C. Kroeck	Cut., fig., sidewalks, 17th St., from Nash to Franklin St.	371.70

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
290	Aug. 9, 1916....	J. S. O'Neill	Cut., fig., sidewalks, 20th St., fr. Teutonia Ave. to S. L. of Freihube's Sub. on W. sidewalk and fr. Teutonia Ave. to Florence St. on the east sidewalk	$ 1,939.61
320	Sept. 1, 1916....	George Czerwinski	Cut., fig., granite pvmt. rem. recut granite pvmt., str. curb, rad. curb, reset, sidewalks, Clinton St., from Virginia St. to 160 ft. N. of N. line of Oregon St.	10,088.40
321	Sept. 1, 1916....	Fred Hildebrand, Jr.	Cut., fig., brick paving, N. alley in Blk. 159, bet. 6th, 7th, Prairie and Chestnut Sts., 2nd Ward	1,128.30
322	Sept. 1, 1916....	Fred Hildebrand, Jr.	Cut., brick paving, alley in blk. between 6th, 7th, Poplar and Chestnut Sts., 2nd Ward	4,082.70
323	Sept. 1, 1916....	Michael Dunn	Cut., fig., cement sidewalks, east side of 14th St., from Atkinson to Lake St.	805.78
324	Sept. 1, 1916....	Paul C. Kroeck	Cut., bit. concrete, brick gutter, alley in blk. bet. 36th, 37th, Wright Sts. and Meinecke Ave.	2,112.70
325	Sept. 1, 1916....	Dean Construction Co.	Cut., fig., drain tile, cement concrete paving, alley in blk. bet. Cramer, Murray, Folsom and Newberry Blvd.	1,502.46
326	Sept. 1, 1916....	Milwaukee Gen'l Const. Co.	Cut., fig., drain tile, cement concrete pvg., alley bet. 6th, 7th, Arthur and Harrison; 5th, 6th, Arthur and Harrison; 4th, Midland, Arthur and Harrison; 5th, Midland, Arthur and Harrison, 14th Ward	9,409.12

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
327	Sept. 1, 1916....	Dean Construction Co.	Cut., flg., drain tile, cement concrete pvg., alley bet. Bartlett, Oakland, Hartford and Concord; Newhall, Bartlett Newport and Hartford; Newhall, Bartlett, Kenwood and Linnwood; Bartlett, Oakland, Providence and Newport; Newhall, Bartlett, Providence and Newport	10,848.02
328	Sept. 1, 1916....	John Weiher	Cut., flg., sandstone, curb, sidewalks, Greenfield Ave., from Barclay to subway of the C. & N. W. Ry. and C. M. & St. P. Ry.	5,279.56
329	Sept. 11, 1916....	Manger Construction Co.	Cut., brick pvg., str. curb, reset, rad. curb, Clybourn St., from 6th St. to 8th St.	8,331.12
330	Sept. 12, 1916....	John Weiher	Granite pvg., Lake St., from Reed to Clinton St.	2,835.00
331	Sept. 15, 1916....	Dean Construction Co.	Sidewalks, north side of State St., from 37th St to 38th St.....	184.73
344	Sept. 28, 1916....	F. P. Caughlin Co.	Grdg., flg., asphalt, cement gutter, comb. curb and gutter, sidewalks, 18th St., from north line of Davis to S. L. of Finn Pl., ext. W.	5,626.71
345	Sept. 28, 1916....	F. P. Caughlin Co.	Flg., asphalt, comb. curb and gutter, sidewalks, 16th St., from N. L. of Finn Pl. to S. L. of Nash St.	4,278.87
346	Sept. 28, 1916....	Badger Construction Co.	Cut., flg., brick gutter, bit. concrete pvg., alley bet. 50th, 51st, Vine Sts. and Pabst Ave., 19th Ward	2,055.20
347	Sept. 29, 1916....	Badger Construction Co.	Cut., brick gutter, bit. concrete paving, alley bet. 8th, 9th, Galena and Walnut Sts., 6th Ward	1,994.30

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
348	Oct. 2, 1916....	Badger Construction Co.	Cut., flg., brick gutter, bit. concrete pvg., alley bet. 20th, 21st, Wright and Clarke Sts., 7th Ward	2,468.65
349	Oct. 2, 1916....	Badger Construction Co.	Cut., brick gutter, bit. concrete pvg., alleys bet. 8th, 9th, Locust and Chambers, and bet. 8th, 9th, Chambers and Burleigh, 25th Ward	3,588.00
350	Sept. 28, 1916....	Badger Construction Co.	Cut., flg., asphalt, brick gutter, str. sand. curb, rad. sand curb, sidewalks, 3rd St., from N. L. of Keefe Ave. to a line 612 ft. N. of N. L. of Keefe Ave.	7,126.12
351	Sept. 29, 1916....	White Construction Co.	Cut., brick gutter, asphalt, alley bet. Mason, Oneida, Jackson and Jefferson Sts., 3rd Ward	940.45
352	Sept. 28, 1916....	White Construction Co.	Cut., flg., rem. pvmt., asphalt, brick gutter, concrete retaining wall, str. curb, rad. curb, reset, sidewalks removed, Jefferson St., from center line of Mason St. to south curb line of Biddle	15,146.97
353	Sept. 28, 1916....	John Weiher	Cut., flg., brick gutter, bit. concrete, alleys bet. Sherman Blvd., 44th St., Meinecke, and Wright; bet. Grant, Sherman, Wright and Meinecke; bet. 40th, 41st, Wright and Clarke, and bet. 39th, 40th, Wright and Clarke St., 22nd Ward	7,931.98
354	Sept. 28, 1916....	John Weiher	Cut., brick gutter, bit. concrete pvg., alleys bet. 26th, 27th, Wright and Kilbourn; bet. Tamarack, 27th, Fond du Lac and Kilbourn, 22nd Ward	3,722.26

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
355	Sept. 28, 1916....	John Weiher	Cut., brick gutter, bit. concrete, alley bet. Wright, Clarke, 41st and Grant Blvd., 22nd Ward	2,079.18
356	Sept. 28, 1916....	John Weiher	Cut., flg., brick gutter, bit. concrete pvg., alley bet. 40th, 41st, Meinecke Ave. and Wright Sts., 22nd Ward	1,936.38
357	Sept. 28, 1916....	John Weiher	Cut., brick gutter, bit. concrete, alleys bet. 45th, 46th, Pabst and Elm, and bet. 44th, 45th, Pabst and Lisbon Ave.	4,722.05
358	Sept. 28, 1916....	John Weiher	Cut., flg., brick gutter, bit. concrete pvg., alleys bet. W. 24th, 25th, North and Meinecke Ave.; bet. 25th, 26th, Elm and North and bet. 26th, 27th, Elm and North, 22nd Ward	7,121.16
359	Sept. 28, 1916....	John Weiher	Cut., flg., brick gutter, bit. concrete pvg., alleys bet. 34th, 35th, Lloyd and Elm; bet. 35th, 36th, Elm and North, 22nd Ward	3,315.92
360	Sept. 28, 1916....	John Weiher	Cut., brick gutter, bit. concrete pvg., alley bet. 32nd, 33rd, Wright and Clark, 22nd Ward	1,958.52
361	Sept. 28, 1916....	John Weiher	Cut., brick gutter, bit. concrete pvg., alley bet. 37th, 38th, Elm and North Ave., 22nd Ward	1,991.75
362	Sept. 28, 1916....	John Weiher	Cut., brick gutter, bit. concrete pvg., alleys bet. 34th, 35th, Wright and Clarke; bet. 36th, 37th, Clarke and Center	3,937.07
363	Sept. 28, 1916....	Paul C. Kroeck	Cut., flg., pvmt. rem., brick gutter, bit. con. pvg., alley bet. 3rd, 4th, Walnut and Sherman Sts., 6th Ward	1,696.23
364	Oct. 2, 1916....	Paul C. Kroeck	Cut., flg., brick gutter, bit. concrete pvg., alleys bet. 31st, 32nd, Mt. Vernon and Park Hill; bet. 33rd, 34th, Clybourn and St. Paul, 16th Ward	3,309.38

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
365	Oct. 2, 1916....	Paul C. Kroeck	Cut., brick gutter, bit. concrete pvg., alley bet. 33rd, 34th, Walnut and Lisbon, 19th Ward	1,923.21
366	Sept. 29, 1916....	Paul C. Kroeck	Cut., brick gutter, bit. concrete paving, alley bet. 15th, 16th, State and Prairie Sts., 2nd Ward	1,087.16
367	Oct. 2, 1916....	Paul C. Kroeck	Cut., pvmt. rem., bit. concrete pvg., brick gutter, Holle Pl., bet. 9th, 10th, Center and Hadley, also S. alley rng, E. and W., in same block, 25th Ward	3,806.54
368	Sept. 28, 1916....	Dean Construction Co.	Cut., drain tile, cement concrete paving, alley bet. 13th, 14th, Galena and Walnut Sts., 9th Ward	1,481.98
369	Sept. 28, 1916....	Dean Construction Co.	Cut., drain tile, cement concrete paving, alley bet. 38th, 39th, Galena and Walnut Sts., 19th Ward	1,551.46
370	Sept. 28, 1916....	Dean Construction Co.	Cut., drain tile, cement concrete paving, alley bet. 40th, 41st, Brown Sts. and Pabst Ave., 19th Ward	932.62
371	Sept. 28, 1916....	Dean Construction Co.	Cut., drain tile, cement concrete paving, alley bet. 32nd, 33rd. Lloyd and Elm Sts., 22nd Ward	1,371.36
372	Sept. 28, 1916....	Dean Construction Co.	Cut., drain tile, cement concrete paving, alley bet. 32nd, 33rd, North and Meinecke, 22nd Ward	2,300.78
373	Sept. 28, 1916....	Manger Construction Co.	Cut., flg., pvmt. removed, cement cencrete pvg., drain tile, alley bet. 13th, 14th, Wells and Grand, 4th Ward	1,536.80
374	Sept. 28, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete pvg., alley bet. 1st, 2nd, Harmon and Reservoir, 6th Ward	1,587.28

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
375	Sept. 28, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete pvg., alley bet. 14th, 15th, State and Cedar Sts., 2nd Ward	$ 1,338.14
376	Sept. 28, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete pvg., alleys bet. 37th, 38th, Elm and Pabst Ave., and bet. 35th, 36th, Elm and Pabst., 22nd Ward	4,154.29
377	Sept. 28, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete pvg., alleys bet. 36th, 37th, Wright and Clarke; bet. 35th, 36th, Meinecke and Wright 22nd Ward	4,518.92
378	Sept. 28, 1916....	Michael Dunn	Cut., flg., sidewalks, 21st St., from northerly line of Teutonia Ave. to N. line of Rosemont	300.58
379	Sept. 28, 1916....	Michael Dunn	Cut., flg., sidewalks, 10th St., from N. line of Graham St. to N. line of Cont. of Williamsburg Hts.	1,013.84
380	Sept. 28, 1916....	Frank Banaszak	Sidewalks, 6th Ave., from Montana St. to Dakota St.	567.67
381	Sept. 28, 1916....	Frank Banaszak	Comb. cement curb and gutter, Ellen St., Russell Ave. to Pryor Ave.	167.20
382	Sept. 28, 1916....	Fred Hildebrand, Jr., ...	Cut., flg., drain tile, cement concrete pvg., alley bet. 25th, 26th Ave., Becher and Rogers Sts., 24th Ward	1,922.80
383	Sept. 28, 1916....	Fred Hildebrand, Jr., ...	Cut., flg., cobblestone rem., brick paving, alley bet. Lake, S. Water, Clinton and Reed, 5th Ward	974.75
384	Sept. 28, 1916....	Milwaukee Gen'l Const. Co.	Cut., flg., drain tile, cement concrete pvg., alleys bet. 6th, 7th, Arthur and Hayes; bet. 7th, 8th, Arthur and Hayes Ave., 14th. Ward	4,855.04

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
385	Sept. 28, 1916....	S. P. Croft	Cut., flg., sidewalks, 22nd St., from N. line of Clybourn St. to S. line of Sycamore St.	$ 2,778.94
386	Sept. 28, 1916....	Frank Schomann	Cut., drain tile, cement concrete pvg., S. alley rng. E. and W., bet. 27th, 28th, Elm Sts. and North Ave., 22nd Ward.....	776.59
387	Sept. 28, 1916....	W. E. Lippmann	Limestone gutter pvg., new limestone curb, Grant St., from W. line of Greenbush St. to E. line of Grove St.	540.00
395	Oct. 16, 1916....	Fred Hildebrand, Jr., ...	Cut., brick paving, alley bet. 4th, 5th, Sherman and Walnut	1,991.85
396	Oct. 16, 1916....	Fred Hildebrand, Jr., ...	Cut., brick pvg., alley bet. 14th, 15th, State and Prairie.....	3,588.20
397	Oct. 16, 1916....	John H. Donahue	Cut., flg., drain tile, cem. concrete pvg., alleys bet. Folsom, Newberry, Oakland and Cramer, and bet. Folsom, Linwood, Newhall and Bartlett, 18th Ward	3,529.65
398	Oct. 16, 1916....	John H. Donahue	Cedar Blk. pvmt., rem., flg., cem. concrete pvg., drain tile, alley bet. Farwell, Prospect, Irving & Lafayette, 1st Wd.	758.45
399	Oct. 16, 1916....	Paul C. Kroeck	Cut., brick gutter, bit. concrete pvg., alley bet. 15th, 16th, Cedar and Wells, 4th Ward	1,233.56
400	Oct. 16, 1916....	Paul C. Kroeck	Cut., brick gutter, bit. concrete pvg., alleys bet. 36th, 37th, Elm Sts. and North Ave., 22nd Ward	1,843.87
401	Oct. 16, 1916....	Paul C. Kroeck	Cut., flg., brick gutter, bit. concrete pvg., alleys bet. Island Ave., Richards, Burleigh and Ring Sts., 21st Ward.....	2,535.45
402	Oct. 16, 1916....	Paul C. Kroeck	Cut., brick gutter, bit. concrete pvg., alley bet. 16th, 17th, Vine and Walnut Sts., 9th Ward	2,634.76

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
403	Oct. 16, 1916....	Paul C. Kroeck	Cut., bit. concrete paving, cem. curb and gutter, Orchard Pl., from W. line of 27th Ave. to E. line of 28th Ave.	$ 1,600.35
404	Oct. 16, 1916....	Paul C. Kroeck	Cut., brick gutter, bit. concrete pvg., alley bet. 25th and 26th Aves., National Ave. and Scott St., 23rd Ward	2,963.20
405	Oct. 16, 1916....	Manger Construction Co.	Cut., drain tile, cement concrete pvg., alleys bet. North Ave., Lee St., Teutonia Ave. and 12th St., and bet. 10th, 11th, Lee and Wright Sts., 7th Ward	2,718.85
406	Oct. 16, 1916....	Manger Construction Co.	Cut., brick paving, S. alley rng. E. and W., Blk. 119, bet. Vliet, Winnebago, 8th and 9th Sts., 2nd Ward	1,036.86
407	Oct. 16, 1916....	Manger Construction Co.	Cut., brick paving, alley bet. Grand Ave., Wells, W. Water Sts., and Milwaukee River, 4th Ward	710.20
408	Oct. 16, 1916....	Manger Construction Co.	Cut., fig., drain tile, cement concrete pvg., alleys bet. Sherman Blvd., 44th St., North Ave. and Elm St., and between 42nd, 43rd, Elm Sts. and North Ave.	3,098.46
409	Oct. 16, 1916....	Badger Construction Co.	Cut., fig., brick gutter, bit. concrete pvg., alley bet. 10th, 11th, Burleigh and Ring Sts., 25th Ward	3,767.10
410	Oct. 16, 1916....	Badger Construction Co.	Cut., fig., brick gutter, bit. concrete pvg., alley bet. 44th, 45th, Wright and Meinecke, and bet. 41st, Grant Blvd., Wright and Meinecke Ave., 22nd Ward	3,396.60
411	Oct. 16, 1916....	Milwaukee Gen'l Const. Co.	Cut., brick gutter, bit. concrete pvg., alleys bet. 6th, 7th, Lincoln and Hayes Aves., and bet. 5th, 6th, Lincoln and Hayes Aves.	4,248.02

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
412	Oct. 16, 1916....	F. P. Caughlin Co.	Old pvmt. rem., asph. pvg., cem. curb and gutter, Farwell Ave., and Stowell Avenue, each from N. line of Park Pl. to S. line of Newberry Blvd.	$ 9,344.82
413	Oct. 16, 1916....	F. P. Caughlin Co.	Cut., asphalt, brk. gtr., new curb, reset, Van Buren St., from N. line of Juneau Ave. to S. line of Odgen Ave.	8,248.12
414	Oct. 16, 1916....	John S. O'Neill	Cut., fig., bit. concrete pvg., cem. curb and gutter, sidewalks, Kathryn Pl., from N. line of Vliet St. to N. line of Sunny Slope	5,214.25
415	Oct. 16, 1916....	John S. O'Neill	Cut., fig., sidewalks, 18th St., fr. Teutonia to N. line of H. A. Mendel's Sub; 19th St., fr. S. line of Freihube and Kelm Sub. to Nash; Franklin St., from 19th to Teutonia Ave.....	1,871.28
416	Oct. 16, 1916....	Dean Construction Co.	Cut., fig., drain tile, cem. concrete pvg., alley bet. 2nd, 3rd, Hadley and Locust Sts., 21st Ward	2,202.44
417	Oct. 16, 1916....	Dean Construction Co.	Cut., fig., old pvmt. rem., brick pvg., alley bet. 3rd, 4th, Prairie and Chestnut Sts., 2nd Ward	4,227.20
418	Oct. 16, 1916....	Michael Switalski	Cut., brick gutter, new curb, rad,. curb, Smith St., from W. line of Howell Ave. to E. line of Burrell St.	2,170.92
419	Oct. 16, 1916....	George Czerwinski	Cut., sandstone, new curb, reset, 8th St., from N. line of Prairie St. to S. line of Chestnut St.	7,134.38
420	Oct. 20, 1916....	Milwaukee Gen'l Const. Co.	Cut., fig., brick gtr., bit. con. pvg., alley bet. Estes, Nock, Superior Sts., and Beulah Ave.	1,700.40

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
425	Oct. 7, 1916....	Star Cement Sidewalk Co.....	Cement sidewalks on the W. side of Teutonia Ave., between Keefe Ave. and Kent St.	$ 212.18
304	Aug. 28, 1916....	M. Synovitz	Sewer in 39th St., from Locust to Burleigh	2,318.40
305	Aug. 28, 1916....	W. T. Werner	Sewer in Nash St., from 14th to 17th St.	822.26
306	Aug. 28, 1916....	Geo. E. Zimmermann	Sewer in 18th St., from Davis to Teutonia	980.00
307	Aug. 28, 1916....	Geo. E. Zimmermann	Concrete and pipe sewer in 5th St., from Lake to Jefferson....	3,600.60
308	Aug. 28, 1916....	W. T. Werner	Concrete and pipe sewer in 4th St., from Lake to Vienna St.....	3,892.90
309	Aug. 28, 1916....	W. T. Werner	Concrete and pipe sewer in 3rd St., from Lake to Becker Ave.	6,718.56
310	Aug. 28, 1916....	Herman Hohensee	Sewer in Washington Blvd., both sides, from Hawley Road to City limits	714.76
311	Aug. 28, 1916....	Geo. E. Zimmermann	Concrete and pipe sewer in 9th St., from Lake St to Green Bay Ave., and in Green Bay Ave., from 9th St. to Keefe Ave.	15,121.88
312	Aug. 28, 1916....	Geo. E. Zimmermann	Sewer in Finn Pl., from 14th to 17th St.	933.45
313	Aug. 28, 1916....	Geo. E. Zimmermann	Sewer in 17th St., from Nash St. to Irving Park	798.75
314	Aug. 28, 1916....	W. T. Werner	Sewer in 8th St., from Green Bay to Atkinson Road	2,507.00
315	Aug. 28, 1916....	W. T. Werner	Sewer in 7th St., from Green Bay Ave. to Atkinson Road.....	949.58
332	Sept. 11, 1916....	M. Synovitz	Sewer in 32nd Ave., fr. Greenfield to Orchard St.; Orchard St., from pt. 12 ft. E. of 32nd Ave. to Trowbridge Ave., and in Trowbridge Ave. from Greenfield to pt. 12 ft. S. of Orchard St.	2,712.60

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
333	Sept. 11, 1916....	M. Synovitz	Sewer in Oklahoma Ave., from 7th to 10 th Ave.	$ 1,480.44
334	Sept. 11, 1916....	Herman Hohensee	Sewer in Richards St., from Lake St. to Keefe Ave.	11,957.76
335	Sept. 11, 1916....	Herman Hohensee	Sewer in Arctic Ave., from Oklahoma Ave. to city limits	426.80
336	Sept. 11, 1916....	Herman Hohensee	Sewer in Dakota St., from 7th to 8th Ave.	932.88
337	Sept. 11, 1916....	H. Hohensee	Reinforced concrete and pipe sewer, Wright St., from 46th St. to W. city limits	500.91
338	Sept. 11, 1916....	George E. Zimmermann	Reinforced concrete and pipe sewer in Liebnitz St., from Lake to Franklin; Franklin St., from Liebnitz to Booth St., and in Booth St., from Franklin St. to Becker St.	9,753.60
339	Sept. 11, 1916....	George E. Zimmermann	Sewer in Montana St., extended, from 6th to 7th Ave.; 7th Ave., from Montana to Dakota St.	1,965.42
340	Sept. 11, 1916....	George E. Zimmermann	Sewer in Cramer St., from Edgewood Ave. to Kenwood Blvd.	5,700.78
429	Nov. 28, 1916....	George E. Zimmermann	Relief sewer in Richards St., from Burleigh to Locust	12,991.58
1	Jan. 5, 1916....	Franklyn R. Mueller & Co.	Composition floors, Municipal Hospital	4,150.00
2	Jan. 5, 1916....	David E. Kennedy, Inc.	Lay cork tiling, Municipal Hospital	5,296.00
3	Jan. 7, 1916....	F. Rosenberg Elevator Co.	Construct and install electric elevators and dumb waiters, Municipal Hospital	6,094.00
91	Mar. 7, 1916....	Otis Elevator Co.	Repair elevators in City Hall	330.00
109	Mar. 17, 1916....	F. Rosenberg Elevator Co.	Automatic shutoff on elevators, City Hall	996.00
138	Mar. 24, 1916....	Milwaukee Bridge Co.	Furnish structural steel, for Chestnut and Clinton St. swing Bridge	1,565.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
143	Mar. 24, 1916....	Northwestern Bridge & Iron Co.	Structural steel for footbridge at Gordon Park, over C. M. & St. P. tracks	$ 1,596.00
144	Mar. 24, 1916....	J. D. Morrison	Concrete work for footbridge at Gordon Park, over C. M. & St. P. Tracks	2,493.00
160	Apr. 11, 1916....	Edw. Kirner	Carpenter work, remodeling Muncipal Garage	369.00
161	Apr. 11, 1916....	P. A. Johnson	Painting work, remodeling Municipal Garage	125.00
162	Apr. 11, 1916....	Milwwaukee Gen'l Const. Co.	Concrete, mason and excavating work, remodeling Municipal Garage	2,351.00
163	Apr. 11, 1916....	W. H. Egan Co.	Plumbing and sewerage work, remodeling Municipal Garage	369.00
164	Apr. 11, 1916....	Frank J. Romberger	Galv. iron and tin work, remodeling Municipal Garage	494.00
165	Apr. 11, 1916....	Wenzel & Henoch Co.	Heating Work, remodeling Municipal Garage	1,745.00
166	Apr. 11, 1916....	C. Hennecke Co.	Steel work, remodeling Municipal Garage	3,062.00
168	Apr. 11, 1916....	Federal Asbestos Co., Inc.	Install acoustic correction for District Court Room, City Hall	1,490.00
169	Apr. 12, 1916....	Industrial Heating & Engrg. Co.	Install steam pump for hydraulic elevator service, and install boiler feed pipe	4,210.00
178	Apr. 24, 1916....	P. C. Kroeck	Concrete floors in Center St. Natatorium	712.00
186	May 4, 1916....	S. V. Hanley	Construct enclosed showers with partitions, Greenbush St. Natatorium	515.00
188	May 8, 1916....	Whitney Foundation & Eng. Co.	Construct docks at foot of East St., and both sections of dock on E. side of Milwaukee River, S. of the dam	9,544.00
170	Apr. 14, 1916....	H. Neidner & Co.	Tile wainscoting in North Ave. Natatorium	495.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
214	June 2, 1916....	Arthur G. Modler	Carpenter work, Children's Preventorium	$ 244.00
215	June 2, 1916....	H. J. Krauss & Son	Lathing and Plastering, Children's Preventorium	55.00
226	June 16, 1916....	S. V. Hanley	Plumbing and sewerage work, Children's Preventorium.....	575.00
240	July 8, 1916....	H. W. John-Manville Co.	Composition roof for Central Market on 5th St., bet. Poplar and Vliet Sts.	462.00
294	Aug. 24, 1916....	Thompson & Harriman	Plumbing and Sewerage Work, dining hall, Blue Mound San.	698.00
295	Aug. 24, 1916....	Thompson & Harriman	Heating system, dining hall, Blue Mound San.	825.00
296	Aug. 24, 1916....	Robert Reisinger & Co.	Mason and Concrete work, dining hall, Blue Mound San.	4,135.00
297	Aug. 24, 1916....	P. O. Olsen	Painting and Glazing work, dining hall, Blue Mound San.....	490.00
298	Aug. 24, 1916....	H. E. Schaetzke	Galv. iron and tin work, dining hall, Blue Mound San.	293.00
299	Aug. 24, 1916....	Geo. F. M. Witte	Carpenter work, dining hall, Blue Mound San.	4,994.00
300	Aug. 24, 1916....	H. J. Krauss & Son	Lath and Plastering work, dining hall, Blue Mound San.....	950.00
394	Oct. 16, 1916....	Kowalsky Hardware Co.	Kitchen cooking apparatus, dining hall, Blue Mound San.....	1,483.50
423	Nov. 6, 1916....	Jos. Wittig	Install sewerage system, Blue Mound San.	3,141.00
430	Dec. 16, 1916....	Gen'l Heating & Ventilating Co.	Construct spiral riveted exhaust pipe, City Hall boiler room	1,733.00
431	Dec. 16, 1916....	Downey Htg. & Supply Co.....	Repair generator engine	250.00
432	Dec. 26, 1916....	M. J. Walsh Machinery Co.	Furnish and install engine lathe for Municipal Garage.....	1,262.25
434	Dec. 30, 1916....	Edw. E. Gillen Co.	Construct pile cluster pier at Cherry St. Bridge, and protection piling at 6th St. Bascule bridge	3,137.00
433	Dec. 30, 1916....	Lakeside Bridge & Steel Co.....	Center lock for Broadway bascule bridge and repairs to 16th St. Viaduct	840.00
4	Jan. 27, 1916....	R. D. Wood & Co.	Fire hydrants	7,150.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
6	Jan. 27, 1916....	Windsor Mfg. Co.	10 tons Omaha lead	$ 1,270.00
27	Feb. 9, 1916....	Chapman Valve Mfg. Co.	Gate valves	4,871.80
28	Feb. 9, 1916....	Chapman Valve Mfg. Co.	Special or tapping valves	1,282.50
29	Feb. 9, 1916....	Nortmann-Duffke Foundry Co...	Special castings	4,425.00
30	Feb. 9, 1916....	American Cast Iron Pipe Co.....	Class "C" Water Pipe	50,660.00
34	Feb. 15, 1916....	United Brass Mfg. Co.	Curb cocks	2,075.00
64	Mar. 1, 1916....	Haisler Transfer Co.	Hauling water pipe	2,910.00
65	Mar. 1, 1916....	Jos. B. Forrestal Co.	Lay 12 miles of 6-in. water main	22,017.60
66	Mar. 1, 1916....	Edw. O'Donnell	Lay water main	14,572.80
108	Mar. 14, 1916....	Bernard Cannon	Annual report, Water Department	319.50
110	Mar. 20, 1916....	O'Brien & Jackson	Extension of Linwood Ave. Intake and Lake Shaft	476,652.50
254	July 19, 1916....	U. S. Cast Iron & Pipe Fdry. Co...	Class "C" Water Pipe	916.50
31	Feb. 10, 1916....	The Holt Electric Co.	Electric motors in repair shop, Fire Department	863.00
189	Apr. 2, 1916....	T. M. E. R. & L. Co.	Furnish power to Fire Department Repair Shop	.....
216	June 12, 1916....	American-La France Fire Engine Co.	3 Automobile combination pumping engine and hose wagon	22,350.00
241	July 3, 1916....	Thos. E. Hoye Heating Co.....	Install steam heating plant in engine house No. 13.....	845.00
242	July 3, 1916....	Downey Heating & Supply Co.....	Install steam heating plant in engine house No. 5 and truck No. 3	970.00
229	Aug. 7, 1916....	Mitchell Automobile Co.	Mitchell roadster for Fire Department	1,500.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
293	Aug. 23, 1916....	R. J. Hickey	Connect and extend pipe line from intersection Walnut and 2nd, into alley bet. 2nd and 3rd Sts., and extending to North Ave., excepting blk. bet. Lloyd St. and Garfield Ave.	$ 2,825.00
316	Sept. 6, 1916....	General Htg. & Ventilating Co...	Furnish and set up 1 firebox boiler, Squadron No. 1, Fire Dept.	329.00
392	Oct. 9, 1916....	McCoy-Nolan Co.	Furnish 3½ inch fire hose for Fire Department	1,750.00
393	Oct. 9, 1916....	C. C. C. Fire Hose Co.	Furnish 2½ inch fire hose for Fire Department	4,725.00
33	Feb. 12, 1916....	Elgin St. Sweeper Co.	Two Elgin motor sweepers	7,500.00
54	Feb. 23, 1916....	The Studebaker Corp. of Am.....	8 Studebaker power street flushers	9,400.00
148	Apr. 3, 1916....	Standard Oil Co.	Road Oil	9,840.00
149	Apr. 3, 1916....	Barrett Manufacturing Co.	Road Oil	2,875.00
150	Apr. 3, 1916....	Barber Asphalt Paving Co.....	Road Oil	3,750.00
151	Apr. 3, 1916....	Barber Asphalt Paving Co.....	Road Oil	3,750.00
181	Apr. 26, 1916....	Sterling Motor Truck Co.....	1 Sterling Kindling truck with squeegee equipment with automatic dump body	5,000.00
187	May 5, 1916....	The Thomas Co.	Furnish street signs and posts	3,072.00
196	Cancelled.			
197	May 12, 1916....	The Thomas Furnace Co.	Granulated slag	1,500.00
195	May 11, 1916....	The Barrett Company	Road Oil	4,000.00
198	May 15, 1916....	Lake Shore Stone Co.	Granite Chips	2,460.00
227	June 20, 1916....	Northern Reduction Co.	Colection and disposal of all large dead animals.....Per Mo.	5.00
167	Apr. 14, 1916....	Arthur H. Vogel	Dredging the several rivers and canals	30,000.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
219	June 13, 1916....	A. H. Vogel	Dredge a channel from the Racine St. Br., N. to the Milwaukee River Flushing Tunnel	$ 5,000.00
388	Oct. 2, 1916....	Edw. E. Gillen	Dock at S. dock line of Menomonee R., west of Reed St., make alterations in water mains and construct cofferdam, take up extra pipe	30,000.00
422	Oct. 30, 1916....	Ed. E. Gillen Co.	Construct docks at foot of National Ave., and at foot of alley between Clybourn and Fowler	2,002.00
5	Feb. 1, 1916....	Grand Ledge Clay Products Co.	Vitrified clay conduits, Fire and Police Alarm System	2,000.00
32	Feb. 10, 1916....	Packard Motor Car Co.	Packard touring car, Common Council	3,176.00
67	Mar. 6, 1916....	W. T. Werner	House Drains and Water Connections, Auer Ave., from Achilles to 1st St.	40.75
68	Mar. 6, 1916....	W. T. Werner	House Drains and water connections, 26th Ave., Lincoln to Hayes	72.45
69	Mar. 6, 1916....	W. T. Werner	House drains and water connections, George St., Richards to N. Pierce	204.50
70	Mar. 6, 1916....	W. T. Werner	House drains and water connections, Hopkins St., Chambers to Teutonia	228.20
71	Mar. 6, 1916....	W. T. Werner	House drains and water connections, American Ave., from Cleveland to R. of W. of C. & N. W. Ry.	918.10
72	Mar. 6, 1916....	W. T. Werner	House drains and water connections, 7th Ave., Cleveland to R. of W. of C. & N. W. Ry.	202.50

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
73	Mar. 6, 1916....	W. T. Werner	House drains and water connections, 29th Ave., Greenfield to Lapham	$ 492.55
74	Mar. 6, 1916....	W. T. Werner	House drains and water connections, 28th Ave., Greenfield to Lapham	354.50
75	Mar. 6, 1916....	W. T. Werner	House drains and water connections, Knapp St., Jackson to Astor	45.90
76	Mar. 6, 1916....	W. T. Werner	House drains and water connections, 26th St., Pease to Franklin	418.20
77	Mar. 6, 1916....	George E. Zimmermann.....	House drains and water connections, 8th St., Atkinson to Graham St.	387.20
78	Mar. 6, 1916....	George E. Zimmermann.....	House drains and water connections, Arthur Ave., 26th to Layton Blvd.	313.25
79	Mar. 6, 1916....	George E. Zimmermann.....	House drains and water connections, 30th St., Concordia to Townsend	1,305.20
80	Mar. 6, 1916....	George E. Zimmermann.....	House drains and water connections, Cleveland Ave., American to 11th	121.60
81	Mar. 6, 1916....	George E. Zimmermann.....	House drains and water connections, 19th Ave., Rogers to Greenfield	453.10
82	Mar. 6, 1916....	Frank J. Smith	House drains and water connections, 5th Ave., from Cleveland Ave. to R. of W. of C. & N. W. Ry.	188.50
83	Mar. 6, 1916....	Frank J. Smith	House drains and water connections, Holton St., Burleigh to Hadley	314.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
84	Mar. 6, 1916....	Frank J. Smith	House drains and water connections, Concordia Ave., Booth to Humboldt	$ 22.00
85	Mar. 6, 1916....	Frank J. Smith	House drains and water connections, Weil St., Auer to Burleigh	716.80
86	Mar. 6, 1916....	Herman Hohensee	House drains and water conections, Kenilworth Pl., Terrace to Prospect Ave.	133.30
87	Mar. 6, 1916....	Herman Hohensee	House drains and water connections, Chestnut St., 12th to 18th St.	102.99
88	Mar. 6, 1916....	Arthur Kehrein	House drains and water connections, Ring St., from Richards to 2nd	306.00
111	Mar. 20, 1916....	F. A. Goll	House drains and water connections, 50th St., Vliet to Washington Blvd.	873.00
112	Mar. 20, 1916....	F. A. Goll	House drains and water connections, Superior St., Oklahoma to city limits	941.00
113	Mar. 20, 1916....	F. A. Goll	House drains and water conections, 53rd St., Vliet St. to Vine St.	2,827.60
114	Mar. 20, 1916....	F. A. Goll	House drains and water connections, Keefe Ave., fr. Humboldt Ave. to Pt. Washington Road	4,934.10
115	Mar. 20, 1916....	F. A. Goll	House drains and water connections, 52nd St., Washington Blvd. to Vine St.	805.00
116	Mar. 20, 1916....	F. A. Goll	House drains and water connections, New York Ave., Delaware to city limits	651.80

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
117	Mar. 20, 1916....	Frank J. Smith	House drains and water connections, Wyoming Pl., from Pennsylvania Ave. to Kinnickinnic Ave.	$ 1,125.60
118	Mar. 20, 1916....	Frank J. Smith	House drains and water connections, Pennsylvania Ave., Beulah Ave. to city limits	374.85
119	Mar. 20, 1916....	Frank J. Smith	House drains and water connections, Vine St., from 52nd to 55th St.	62.00
120	Mar. 20, 1916....	Frank J. Smith	House drains and water connections, Deer Pl., from Howell to West St.	719.95
121	Mar. 20, 1916....	Frank J. Smith	House drains and water connections, Sherman Blvd., Wright to Center	684.00
122	Mar. 20, 1916....	Frank J. Smith	House drains and water connections, 22nd St., from Hopkins to Keefe	37.30
123	Mar. 20, 1916....	Frank J. Smith	House drains & water connections, 35th St., Vliet to Lloyd Sts.	595.00
124	Mar. 20, 1916....	Frank J. Smith	House drains and water connections, 51st St., fr. Washington Blvd. to Vliet St.	391.25
125	Mar. 20, 1916....	Herman Hohensee	House drains and water connections, Clybourn St. fr. 27th to 35th St.	405.60
126	Mar. 20, 1916....	Herman Hohensee	House drains and water connections, Center St., Fond du Lac to 30th	66.08
127	Mar. 20, 1916....	Herman Hohensee	House drains and water connections, Center St., 32nd to 36th St.	762.19
128	Mar. 20, 1916....	Herman Hohensee	House drains & water connections, Elm St., 49th to 52nd St.	66.98

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
129	Mar. 20, 1916....	George E. Zimmermann	House drains and water connections, Locust St., from 29th to Fond du Lac Ave.....	176.70
130	Mar. 20, 1916....	George E. Zimmermann	House drains and water connections, Delaware Ave., Oklahoma to city limits	940.60
131	Mar. 20, 1916....	T. G. Holton	House drains and water connections, 21st Ave., Lincoln to Rogers	213.00
132	Mar. 20, 1916....	T. G. Holton	House drains and water connections, 16th Ave., Maple to Greenfield	83.90
133	Mar. 20, 1916....	Arthur Kehrein	House drains and water connections, North Ave., 48th to 53rd St.	602.00
134	Mar. 20, 1916....	Arthur Kehrein	House drains and water connections, Hopkins, Keefe to 27th	563.00
135	Mar. 20, 1916....	W. T. Werner	House drains and water connections, 14th Ave., Hayes to Arthur Ave.	381.15
136	Mar. 20, 1916....	W. T. Werner	House drains and water connections, 33rd St., Burleigh to Climax Sub.	785.55
137	Mar. 23, 1916....	Western Electric Co.	Furnish underground cable	3,160.07
171	Apr. 21, 1916....	George E. Zimmermann	House drains and water connections, Walnut St., 3rd to 4th	80.00
172	Apr. 21, 1916....	George E. Zimmermann	House drains and water connections, Harrison St., Hanover to Greenbush	209.30
173	Apr. 21, 1916....	George E. Zimmermann	House drains and water connections, Hanover St., Harrison to Reserved Lot V.	426.20

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
174	Apr. 21, 1916....	George E. Zimmermann	House drains and water connections, 54th St., Vliet to Washington Blvd.	$ 683.60
175	Apr. 21, 1916....	Frank J. Smith	House drains and water connections, 39th St., from Clark to Center	145.00
176	Apr. 21, 1916....	George E. Zimmermann	House drains and water connections, Hayes Ave., Forest Home Ave to 26th Ave.	387.00
177	Apr. 21, 1916....	Frank J. Smith	House drains and water connections, 52nd St., Vliet to Washington Blvd.	1,478.40
179	Apr. 26, 1916....	W. T. Werner	House drains and water connections, Pabst Ave., 54th to 55th St.	75.00
180	Apr. 26, 1916....	Broadway Press	Printing annual report, Department of Public Works.....	200.00
199	May 24, 1916....	George E. Zimmermann	House drains and water connections, 2nd Ave. from Windlake to Lincoln	71.00
200	May 24, 1916....	George E. Zimmermann	House drains and water connections, Vliet St., Hawley Rd. to city limits	89.90
201	May 24, 1916....	W. T. Werner	House drains and water connections, Galena St., from 49th to Hawley Rd.	582.65
202	May 24, 1916....	W. T. Werner	House drains and water conections, Cherry St., fr. 54th to Hawley Rd.	493.60
203	May 24, 1916....	George E. Zimmermann	House drains and water connections, Washington Blvd., from 53rd to city limits	221.80

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
204	May 24, 1916....	George E. Zimmermann	House drains and water connections, 18th St., from Davis to Finn Pl., extended	753.60
205	May 24, 1916....	John L. Hahn	House drains and water connections, 17th St., fr. Davis to Finn Pl.	443.82
206	May 24, 1916....	George E. Zimmermann	House drains and water connections, 17th St., fr. Ring to Teutonia Hts.	1,127.00
220	June 16, 1916....	E. T. McDonald	Furnish anthracite coal for Fire, Health, Bridges and Public Bldgs., Miscellaneous Depts. and General City	10,657.00
221	June 16, 1916....	Callaway Fuel Co.	Furnish City of Milwaukee 25 tons coke	187.50
222	June 16, 1916....	Milwaukee-Western Fuel Co.....	Furnish coal to the City of Milwaukee	92,652.50
223	June 16, 1916....	Wisconsin Coal & Dock Co.	Furnish Bitu. Coal to St. Rep. Dept., St. San., Misc., Purch., K. K. Riv. Flushing Sta.	7,430.00
224	June 19, 1916....	The Boehm Bindery	Bind 200 copies Common Council Proceedings, 1915-1916.....	249.00
225	June 19, 1916....	Broadway Press	Furnish City Clerk 1500 copies of Manual of Common Council	450.00
239	June 26, 1916....	S. Heller	Furnish hydraulic elevator direct plunger type for Refuse Incinerator	580.00
270	July 27, 1916....	F. A. Goll	House drains and water connections, Louis Ave., Nash to Atkinson	183.50
271	July 27, 1916....	George E. Zimmermann	House drains and water connections, Lisbon Ave., North to City Limits	122.80
272	July 27, 1916....	George E. Zimmermann	House drains and water connections, Hawley Rd. (55th St.), from Pabst Ave. to Neeskara Hts.	1,939.20

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
273	July 27, 1916....	George E. Zimmermann	House drains and water connections, 30th Ave., Greenfield to Lapham	383.40
274	July 31, 1916....	George E. Zimmermann	House drains and water connections, Cedar St., from 13th to 9th St.	312.00
275	July 31, 1916....	Arthur Kehrein	House drains and water connections, 31st Ave., Lapham to Greenfield	358.00
276	July 31, 1916....	Arthur Kehrein	House drains and water connections, 14th St., from Nash to Atkinson	761.50
291	Aug. 17, 1916....	F. A. Goll	House drains and water connections, Howell Ave., fr. 4th to City limits	708.80
301	Aug. 23, 1916....	American Steel & Wire Co.....	Wires and cables, Municipal St. Ltg. System	43,230.00
302	Aug. 24, 1916....	Boggis-Deitz Electric Co.	Wires and cables, Municipal St. Ltg. System	17,600.00
303	Aug. 16, 1916....	Line Material Co.	Refracting glassware, Municipal St. Ltg. System	22,860.00
317	Aug. 23, 1916....	Jul. Andrae & Sons Co.	Wires and cables, Municipal St. Ltg. System	119,240.00
318	Aug. 22, 1916....	Hazard Manufacturing Co.	Wires and cables, Municipal St. Ltg. System	10,284.00
319	Sept. 6, 1916....	American Steel & Wire Co.	Wire for Municipal St. Ltg. System	33,000.00
341	Sept. 22, 1916....	Universal Concrete Products Co.	Concrete post shafts and brackets, Municipal St. Ltg. Sys.	114,075.00
343	Sept. 22, 1916....	Kuhlman Electric Co.	Transformers and transformer coils, Mun. St. Ltg. System.....	35,306.72
389	Oct. 5, 1916....	Arthur G. Modler	Construct 5 shelter sheds, various wards	1,735.00
390	Oct. 9, 1916....	Central Foundry Co.	Cast iron harps and fittings for concrete posts, Mun St. Ltg. System	10,800.00

LIST OF CONTRACTS AWARDED DURING 1916—Continued.

Contr't No.	DATE.	CONTRACTOR.	WORK OR MATERIAL.	AMOUNT.
391	Oct. 9, 1916....	Jul. Andrae & Sons Co.	Cast iron harps and fittings for concrete posts, Mun. St. Ltg. System	3,440.00
421	Nov. 3, 1916....	Herman Hohenses	House drains and water connections, 16th St., from Finn Pl. to Nash	350.00
424	Nov. 1, 1916....	Commercial Truck Co. of Am.....	Furnish 1 lamp trimming wagon for Bur. of Illumination.....	3,430.00
428	Dec. 1, 1916....	Line Material Co.	Furnish street ltg. fix. for Municipal St. Ltg. System.....	11,250.50

January 1, 1917

List of Permanent Pavements Upon Which the Guarantee Period Commences in 1916

PERMANENT PAVEMENTS UNDER GUARANTEE.

An additional list of streets and alleys having permanent pavements, the guarantee period of same commencing during the year 1916, as follows:—

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Milwaukee Genl. Const. Co...	Alley Blk. 6, Mrs. Z. W. Estes Sub., 17th Wd., bet. Estes, Nock, Superior Sts. and Beulah Ave.			1	Bit. Con.	Nov. 18, 1917
Badger Construction Co.	Alley, Blk. 1, Hi-Mount Subd., bet. Hi-Mount Blvd., 51st St., Pabst Ave. and Vine St., 19th Ward			1	Bit. Con.	Nov. 8, 1917
Paul C. Kroeck	Alley Blk. 8, Western Ave. Park, Blk. 3, Steger's Sub. and Lands in S. W. ¼ Sec. 13, 22nd Wd., bet. 36th, 37th, Wright Sts. and Meinecke Ave.			1	Bit. Con.	Nov. 1, 1917
George Czerwinski	Alley, Blk. 3, Milw. Svg. & Inv. Assn. Sub. No. 2, and Blk. 5, Williamsburg Hts., 25th Wd., bet. 11th, 12th, Davis Sts. and Finn Pl.			1	Concrete	July 22, 1917
Milwaukee Genl. Const. Co...	Alley Blk. 11, Trowbridge Park Cont., 24th Wd., bet. 24th and 25th Aves., Becher and Rogers Sts.			1	Concrete	Aug. 1, 1917
Paul C. Kroeck	Alley Blk. 63, 3rd Wd., bet. Broadway, Biddle, Milwaukee and Oneida Sts.			5	Brick	May 15, 1921
F. P. Caughlin Co.	Auer Ave.	1st St.	Achilles St.	5	Asphalt	June 20, 1921
John Weiher	Alley Blk. 15, Ludington's Add. of 24 A. in N. E. ¼ of Sec. 18, 20th Wd., bet. 18th, 19th, Center and Hadley Sts.			5	Brick	June 26, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET FROM TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Manger & McGucken	S. Alley rng. E. and W., Blk. 4, Edgewood, 16th Wd., bet. Wells, Cedar, 34th and 35th Sts.	5	Brick	June 23, 1921
White Construction Co.	Arthur Ave. Layton Blvd. 26th Ave.	5	Asphalt	July 17, 1921
Henry Hase	Alley Blk. 45, 2nd Wd., bet. 5th, 6th, State and Prairie	5	Brick	Aug. 29, 1921
George Czerwinski	S. Alley, Blk. 170, 4th Ward, bet. 7th, 8th, Wells and Cedar	5	Brick	Sept. 27, 1921
Manger Construction Co.	S. Alley rng. E. and W., Blk. 269, Hawley Sub. No. 2, bet. 24th, 25th, State and Cedar Sts.	5	Brick	Sept. 20, 1921
Manger Construction Co.	Alley, Blk. 11, Milw. Svg. & Inv. Assn. Sub. No. 2, bet. 11th 12th, Ring Sts. and Concordia Ave.	5	Brick	Sept. 2, 1921
Manger Construction Co.	Alley Blk. 3, Foster and Brand's Sub., Blk. 2, Newberry Hill and Blk. 2, Cont. of Newberry Hill, 18th Wd., bet. Folsom, Linwood, Cramer and Oakland	5	Brick	Oct. 16, 1921
Dean Construction Co.	Alley in Sub. of N. 4. A., etc. in N. ½ of N. E. ¼, Sec. 5, Blk. 153 Allcott's Sub. & Assmt. Sub. No. 55, bet. Lapham, Mitchell, Clinton and Reed	5	Brick	July 8, 1921
Dean Construction Co.	E. Alley, Blk. "L" Sub. of W. ½ of S. W. ¼ Sec. 17, bet. 7th, 8th, Lee and Wright Sts., 7th Ward	5	Brick	June 26, 1921
Dean Construction Co.	Alley in Blk. 2, Badger State Park & Blk. 2, Florence Investment Co.'s Sub. No. 1, bet. 21st, 22nd, Chambers and Burleigh, 20th Ward	5	Brick	June 19, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
White Construction Co.	American Ave.	Cleveland Ave.	R. of W. of C. & N. W.	5	Asphalt	Nov. 9, 1921
White Construction Co.	Alley Blk. 21, 3rd Wd., bet. Jackson, Jefferson, Mason and Oneida Sts.			5	Asphalt	Nov. 20, 1921
Fred Hildebrand, Jr.	E. & W. Alley Blk. 5, Walker's Point, 5th Ward, bet. Lake, South Water, Clinton and Reed Sts.			5	Brick	Nov. 23, 1921
Fred Hildebrand, Jr.	N. Alley Blk. 159, bet. 6th, 7th, Prairie and Chestnut, 2nd Wd.			5	Brick	Nov. 6, 1921
Fred Hildebrand, Jr.	Alley Blk. 131, 2nd Wd., bet. 6th, 7th, Poplar and Chestnut			5	Brick	Nov. 6, 1921
F. P. Caughlin Co.	Bradford Ave.	Prospect Ave.	Downer Ave.	5	Asphalt	July 14, 1921
F. P. Caughlin Co.	Bradford Ave.	Lake Drive	Downer Ave.	5	Asphalt	July 17, 1921
White Construction Co.	Becher St.	Layton Blvd.	Muskego Ave.	5	Asphalt	Sept. 27, 1921
John Weiher	Concordia Ave.	26th St.	27th St.	1	Bit. Con.	June 8, 1917
F. P. Caughlin Co.	Concordia Ave.	Booth St.	Humboldt Ave.	5	Asphalt	July 14, 1921
Badger Construction Co.	Chambers St.	17th St.	Hopkins St.	5	Asphalt	June 2, 1921
White Construction Co.	Cedar St.	13th St.	9th St.	5	Asphalt	Sept. 28, 1921
Manger Construction Co.	Clybourn St.	6th St.	8th St.	5	Brick	Nov. 14, 1921
White Construction Co.	Cleveland Ave.	American Ave.	11th Ave.	5	Asphalt	Nov. 9, 1921
Badger Construction Co.	Center St.	Fond du Lac Ave.	30th St.	5	Asphalt	Nov. 8, 1921
		32nd St.	36th St.			
		39th St.	Sherman Blvd.			
Paul C. Kroeck	Deer Pl.	Howell Ave.	West St.	1	Bit. Con.	July 13, 1917

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Paul C. Kroeck	Delaware Ave.	Oklahoma Ave.	South city limits	1	Bit. Con.	Oct. 2, 1917
Badger Construction Co.	Elm St.	49th St.	50th St.	5	Asphalt	July 10, 1921
Manger Construction Co.	11th St.	Grand Ave.	Clybourn St.	5	Brick	Nov. 6, 1921
F. P. Caughlin Co.	18th St.	Davis St.	Finn. Pl., ext. W.	5	Asphalt	Nov. 15, 1921
John S. O'Neill	44tn St.	Vliet St.	Chestnut St.	1	Bit. Con.	Aug. 31, 1917
Badger Construction Co.	52nd St.	Vliet St.	Washington Blvd.	1	Bit. Con.	Sept. 29, 1917
John S. O'Neill	45th St.	Vliet St.	Chestnut St.	1	Bit. Con.	Sept. 6, 1917
Badger Construction Co.	Intersections of 46th St.	with Wright St.	and Clarke St.	1	Bit. Con.	Sept. 7, 1917
			Vine St.	1	Bit. Con.	Oct. 10, 1917
Badger Construction Co.	53rd St.	Vliet St.	Nash St.	5	Asphalt	July 5, 1921
F. P. Caughlin Co.	14th St.	Davis St.	Washington Blvd.	5	Asphalt	July 6, 1921
Badger Construction Co.	50th St.	Vliet St.	Washington Blvd.	5	Asphalt	July 5, 1921
Badger Construction Co.	51st St.	Vliet St.	R.ofW. of C. & N.W.	5	Asphalt	Aug. 30, 1921
White Construction Co.	5th Ave.	Cleveland Ave.	State St.	5	Asphalt	Oct. 16, 1921
Badger Construction Co.	15th St.	Cedar St.	Pt. 400 ft. north	5	Asphalt	Oct. 26, 1921
Badger Construction Co.	14th St.	Nash St.	Newberry Blvd.	5	Asphalt	Nov. 20, 1921
F. P. Caughlin Co.	Farwell Ave.	Park Pl.	51st St.	1	Bit. Con.	Oct. 26, 1917
John S. O'Neill	Galena St.	49th St.	North Pierce St.	5	Asphalt	July 27, 1921
F. P. Caughlin Co.	George St.	Richard St.	Trowbridge Ave.	5	Asphalt	Oct. 17, 1921
	Greenfield Ave.	31st Ave.				

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Dean Construction Co.	Harrison Ave.	Hanover St.	Greenbush St.	1	Bit. Con.	Oct. 17, 1917
Dean Construction Co.	Hanover St.	N. L. re. Lot "V"	Harrison St.	1	Bit. Con.	Oct. 17, 1917
Paul C. Kroeck	Howell Ave.	4th St.	Oklahoma Ave.	1	Bit. Con.	Oct. 20, 1917
John Weiher	Hadley St.	Fond du Lac Ave.	30th St.	1	Bit. Con.	June 14, 1917
Badger Construction Co.	Hopkins St.	Keefe Ave.	27th St.	5	Asphalt	June 21, 1921
White Construction Co.	Hayes Ave.	Forest Home Ave.	26th Ave.	5	Asphalt	July 1, 1921
Badger Construction Co.	Hopkins St.	Chambers St.	Teutonia Ave.	5	Asphalt	June 2, 1921
Badger Construction Co.	Hi-Mount Blvd.	Pabst Ave.	Elm St.	5	Asphalt	Aug. 29, 1921
White Construction Co.	Hayes Ave	Midland Ave.	8th Ave.	5	Asphalt	Nov. 9, 1921
F. P. Caughlin Co.	Ivanhoe Place	North Ave.	Prospect Ave.	5	Asphalt	Aug. 31, 1921
Badger Construction Co.	Janke Place	Hopkins St.	Locust St.	5	Asphalt	June 2, 1921
Badger Construction Co.	Jefferson St.	Mason St.	Wisconsin St.	5	Asphalt	Sept. 12, 1921
White Construction Co.	Jefferson St.	Mason St.	Biddle St.	5	Asphalt	Nov. 20, 1921
F. P. Caughlin Co.	Knapp St.	Astor St.	Jackson St.	5	Asphalt	July 11, 1921
F. P. Caughlin Co.	Kenwood Blvd.	Bartlett Ave.	Oakland Ave.	5	Asphalt	July 20, 1921
F. P. Caughlin Co.	Kenwood Blvd.	Downer Ave.	Lake Drive	5	Asphalt	Aug. 21, 1921
F. P. Caughlin Co.	Keefe Ave.	Humboldt Ave.	Pt. Washington Rd.	5	Asphalt	Aug. 28, 1921
Badger Construction Co.	Layton Blvd.	Greenfield Ave.	Lincoln Ave.	1	Bit. Con.	Sept. 11, 1917
Paul C. Kroeck	Louis Ave.	60 ft. N. Nash St.	Atkinson Ave.	1	Bit. Con.	Nov. 15, 1917
Badger Construction Co.	Louis Ave.	Davis St.	Pt. 60 ft. N. Nash St.	1	Bit. Con.	June 2, 1917

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
John Weiher	Linebarger Terrace	Kinnickinnic Ave.	N. L. Lot 15, Blk. 2, Geo. W. Emmons' Sub., 17th Ward	1	Bit. Con.	Oct. 10, 1917
Badger Construction Co.	Locust St.	Janke Pl.	Hopkins St.	5	Asphalt	June 2, 1921
Manger & McGucken	Locust St.	29th St.	Fond du Lac Ave.	5	Brick	Sept. 1, 1921
Badger Construction Co.	Lisbon Ave.	North Ave.	City limits	5	Asphalt	Nov. 6, 1921
Paul C. Kroeck	Meredith St.	Northwestern Ave.	Oklahoma Ave.	1	Bit. Con.	Oct. 2, 1917
White Construction Co.	Maple St.	3rd Ave.	Windlake Ave.	5	Asphalt	July 17, 1921
White Construction Co.	Maple St.	Muskego Ave.	16th Ave.	5	Asphalt	Aug. 10, 1921
White Construction Co.	Mitchell St.	27th Ave.	Pt. 126.50 ft. W. of W. L. of 27th Ave.	5	Asphalt	Nov. 13, 1921
Paul C. Kroeck	New York Ave.	Delaware Ave.	S. city limits	1	Bit. Con.	Oct. 2, 1917
White Construction Co.	19th Ave.	Greenfield Ave.	Rogers St.	1	Bit. Con.	Aug. 15, 1917
F. P. Caughlin Co.	North Pierce St.	S. L. Concordia (W)	N. L. Concordia, (E.)	5	Asphalt	July 14, 1921
White Construction Co.	19th Ave.	Greenfield Ave.	Rogers St.	5	Asphalt	Aug. 15, 1921
Badger Construction Co.	North Ave.	48th St.	53rd St. ext. N.	5	Asphalt	Nov. 1, 1921
Paul C. Kroeck	Pennsylvania Ave.	Beulah Ave.	S. city limits	1	Bit. Con.	Oct. 2, 1917
F. P. Caughlin Co.	Prospect Ave.	Park Pl.	Bradford Ave.	5	Asphalt	July 13, 1921
Badger Construction Co.	Pabst Ave.	52nd St.	56th St.	5	Asphalt	July 21, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
John S. O'Neill	Roadway around Water Tower	Lake Drive	Terrace Ave.	1	Bit. Con.	Oct. 9, 1917
F. P. Caughlin Co.	Ring St.	Richard St.	2nd St.	5	Asphalt	Aug. 9, 1921
John S. O'Neill	17th St.	Ring St.	N.L. Schwartz's Sub.	1	Bit. Con.	Oct. 9, 1917
Paul C. Kroeck	Superior St.	Oklahoma Ave.	S. city limits	1	Bit. Con.	Oct. 2, 1917
White Construction Co.	16th Ave.	Maple St.	Greenfield Ave.	5	Asphalt	Aug. 10, 1921
F. P. Caughlin Co.	17th St.	Davis St.	Finn Pl.	5	Asphalt	Sept. 7, 1921
White Construction Co.	7th Ave.	Cleveland Ave.	R.ofW. of C. & N.W.	5	Asphalt	Nov. 13, 1921
Badger Construction Co.	Sherman Blvd.	Wright St.	Center St.	5	Asphalt	Nov. 9, 1921
F. P. Caughlin Co.	Stowell Ave.	Newberry Blvd.	Park Pl.	5	Asphalt	Nov. 20, 1921
Paul C. Kroeck	28th Ave.	Greenfield Ave.	Lapham St.	1	Bit. Con.	July 10, 1917
Paul C. Kroeck	33rd St.	Burleigh St.	Climax Subd.	1	Bit. Con.	July 10, 1917
John Weiher	30th St.	Concordia Ave.	Townsend St.	1	Bit. Con.	Aug. 23, 1917
Paul C. Kroeck	31st Ave.	Greenfield Ave.	Lapham St.	1	Bit. Con.	Nov. 1, 1917
Badger Construction Co.	25th St.	Pease St.	Franklin St.	5	Asphalt	June 21, 1921
Badger Construction Co.	26th St.	Pease St.	Franklin St.	5	Asphalt	June 21, 1921
Badger Construction Co.	22nd St.	Keefe Ave.	Hopkins St.	5	Asphalt	June 21, 1921
White Construction Co.	29th Ave.	Greenfield Ave.	Lapham St.	5	Asphalt	July 12, 1921
White Construction Co.	24th Ave.	Harrison Ave.	Cleveland Ave.	5	Asphalt	July 17, 1921
White Construction Co.	3rd Ave.	Windlake Ave.	Maple St.	5	Asphalt	July 17, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Limit, Yrs.	Kind Material	Expiration Guarantee
White Construction Co.	24th Ave.	Becher St.	Lincoln Ave.	5	Asphalt	July 21, 1921
White Construction Co.	26th Ave.	Lincoln Ave.	Hayes Ave.	5	Asphalt	July 17, 1921
White Construction Co.	21st. Ave.	Lincoln Ave.	Rogers St.	5	Asphalt	July 20, 1921
Badger Construction Co.	24th Ave.	Forest Home Ave.	Harrison Ave.	5	Asphalt	Sept. 6, 1921
White Construction Co.	39th St.	Clarke St.	Center St.	5	Asphalt	Oct. 19, 1921
Badger Construction Co.	Vine St.	55th St.	52nd St.	5	Asphalt	July 12, 1921
Badger Construction Co.	Vliet St.	Hawley Road	City limits	5	Asphalt	Oct. 2, 1921
Paul C. Kroeck	Wyoming Pl.	Pennsylvania Ave.	Kinnickinnic Ave.	1	Bit. Con.	Oct. 2, 1917
Badger Construction Co.	Western Ave.	Greenfield Ave.	Lapham St.	1	Bit. Con.	Sept. 8, 1917
White Construction Co.	W.½ Windlake Ave.	3rd Ave.	Maple St. inc. triangle	5	Asphalt	July 17, 1921
F. P. Caughlin Co.	Weil St.	Burleigh St.	Auer Ave.	5	Asphalt	Aug. 14, 1921

PERMITS ISSUED DURING THE YEAR ENDING DECEMBER 31, 1916.

1916.	Excavations in Streets and Alleys.		Deposit Building Material.		House Drains.		Storm Drains.		Number of Extensions.	Number of House Moving.	Number of Miscellaneous.
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.			
January	55	$ 66.00	68	$ 120.00	7	$ 69.00	.....	.....	68	2	96
February	50	58.00	57	91.00	8	14.00	.....	.....	108	3	99
March	131	181.00	122	166.00	39	145.00	.....	.....	172	3	170
April	444	982.00	437	496.00	277	1,017.00	.....	.....	320	5	371
May	384	741.00	569	611.00	916	2,926.00	.....	.....	327	14	444
June	275	355.00	463	506.00	145	534.00	.....	.....	249	9	321
July	235	463.00	364	398.00	317	1,146.00	.....	.....	172	4	276
August	283	502.00	375	416.00	250	809.00	.....	.....	236	7	302
September	278	335.00	327	390.00	94	296.00	.....	.....	204	7	258
October	296	367.00	352	424.00	274	893.00	.....	.....	293	3	305
November	257	291.00	161	216.00	303	1,240.00	.....	.....	208	4	240
December	84	88.00	82	130.00	47	152.00	5	$ 15.00	136	6	159
	2772	$ 4,429.00	3377	$ 3,964.00	2677	$ 9,241.00	5	$ 15.00	2493	67	3041

Paid Permits issued	8,831
Free Permits issued	5,601
Total	14,432

Received for Excavation Permits	$ 4,429.00
Received for Deposit Bldg. material permits	3,964.00
Received for House Drain Permits	9,241.00
Received for Storm Drain Permits	15.00
Total	$17,649.00

STATEMENT OF TOTAL ASSESSMENT FOR STREET CONSTRUCTION LEVIED FOR THE YEAR 1916—BEING FOR WORK DONE DURING 1916 AND THE 1916 INSTALLMENT OF PREVIOUS BONDS.

Ward.	Total 1916 Work Assessable.	Installment of 1916 Work Assessed.	1916 Installment of Previous Bonds.	Total 1916 Assessments.
1	$ 7,041.54	$ 1,173.60	$ 1,018.75	$ 2,192.35
2	48,153.26	8,025.55	1,761.87	9,787.42
3	24,318.54	4,053.11	2,610.76	6,663.87
4	19,199.60	3,199.93	2,536.40	5,736.33
5	809.36	134.90	522.43	657.33
6	6,845.44	1,140.94	3,145.35	4,286.33
7	4,313.90	719.01	1,137.83	1,856.84
8	1,351.79	225.86	1,227.61	1,453.47
9	----------	----------	1,633.48	1,633.48
10	----------	----------	788.96	788.96
11	70,642.15	15,720.87	5,273.39	20,994.26
12	2,945.32	490.86	1,070.05	1,560.91
13	52,353.36	8,725.42	1,872.48	10,597.90
14	55,447.86	28,412.47	3,522.94	31,935.41
15	12,034.24	2,005.83	2,400.71	4,406.54
16	17,593.55	3,753.38	1,530.99	5,284.37
17	38,306.64	6,951.90	3,306.98	10,258.88
18	54,007.21	9,001.20	4,553.63	13,554.83
19	45,900.47	16,686.58	2,863.86	19,550.44
20	62,037.12	10,339.83	4,917.21	15,257.04
21	106,906.22	17,818.02	1,930.86	19,748.88
22	45,514.73	9,415.47	5,098.04	14,513.51
23	6,288.24	1,048.04	2,750.00	3,798.04
24	72,526.09	14,798.69	5,714.02	20,512.71
25	45,976.04	16,539.40	4,581.49	21,120.89
	$800,512.67	$180,380.86	$ 67,770.12	$248,150.98

Report

Assessment Department

Department of
Public Works 1916

COMPARATIVE STATEMENT.

For what purpose—	Amount.
Total special assessments and certificates of the Department of Public Works (not including water pipe) for the year 1915	$ 886,506.93
Total special assessments levied by the Department of Public Works (not including water pipe) for the year 1916	526,458.35

GRAND RECAPITULATION

of special assessments for street and alley improvements, of street improvement bonds, of special assessments and water pipe assessments by the Department of Public Works.

For what purpose—	Amount.
Street improvement installments for 1916	$ 180,380.86
Street improvement bonds	67,770.12
Special assessments for sewers	26,620.88
Special assessments for opening streets and alleys	8,753.26
Special assessments for vacating streets and alleys	1,681.40
Special assessments for laying water pipe	18,490.58
Special assessments for laying house drain service and water connections	35,406.04
Special assessments for laying cement sidewalks	13,211.48
Special assessments for sprinkling streets	42,221.81
Special assessment for flushing streets	24,921.33
Special assessments for oiling streets	96,607.22
Special assessments for removing trees	64.35
Special assessments for removing earth from sidewalks	547.45
Special assessments for cutting noxious weeds	5,943.27
Special assessments for removing snow from sidewalks	8,940.47
Special assessments for miscellaneous	3,388.41
Total amount, water pipe excepted	$ 526,458.35
Special assessments for laying water pipe	18,490.58
Grand total	$ 534,948.93

RECAPITULATION

of assessments levied by the Department of Public Works for street and alley improvements during the year 1916.

Ward	Total cost of assessable work.	Installments for 1916.
First	$ 7,041.54	$ 1,173.60
Second	48,153.26	8,025.55
Third	24,318.54	4,053.11
Fourth	19,199.60	3,199.93
Fifth	809.36	134.90
Sixth	6,845.44	1,140.94
Seventh	4,313.90	719.01
Eighth	1,351.79	225.86
Eleventh	70,642.15	15,720.87
Twelfth	2,945.32	490.86
Thirteenth	52,353.36	8,725.42
Fourteenth	55,447.86	28,412.47
Fifteenth	12,034.24	2,005.83
Sixteenth	17,593.55	3,753.38
Seventeenth	38,306.64	6,951.90
Eighteenth	54,007.21	9,001.20
Nineteenth	45,900.47	16,686.58
Twentieth	62,037.12	10,339.83
Twenty-first	106,906.22	17,818.02
Twenty-second	45,514.73	9,415.47
Twenty-third	6,288.24	1,048.04
Twenty-fourth	72,526.09	14,798.69
Twenty-fifth	45,976.04	16,539.40
Total amounts	$ 800,512.67	$ 180,380.86

RECAPITULATION

of assessments levied by the Department of Public Works for th construction of main sewers during the year 1916.

No. of Assessments.	Amount.
731	$26,620.88

OPENING AND EXTENSION OF STREETS AND ALLEYS

The damages awarded for the property proposed to be take in the several proceedings were $26,225.65, of which amount th sum of $8,753.26 was assessed as benefits to surrounding propert and $17,472.39 was made chargable to Street and Alley Openir fund.

The benefits assessed for the property proposed to be vacated the several proceedings were $1,902.40 of which amount the su

of $221.00 was awarded as damages and $1,681.40 was assessed as benefits to surrounding property.

The damages awarded for property proposed to be taken for a Natatorium site, between Lincoln avenue, Hayes avenue, Fifth avenue and Sixth avenue, in the Fourteenth ward were $3,400.00.

The damages awarded for property proposed to be taken for a Market site, between Odell street, Mitchell street, Eighth avenue and Ninth avenue in the Eighth ward, were $16,250.00.

Th damages awarded for property proposed to be taken for the extension of the Secord Ward Haymarket site in the Second ward were $60,700.00.

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR OPENING STREETS AND ALLEYS:

Ward	STREET	FROM	TO	Damages awarded for property taken	Benefits Assessed against property	Amount chargeable to street and alley opening fund
3	Martin St.	Edison Ave.	Milwaukee River	$12,470.00		$12,470.00
19 & 22	54th St.	Vine St.	North Ave.	5,092.50	$3,833.10	1,259.40
20	Herbert St.	22nd St.	W. 24th St.	5,105.00	2,737.01	2,367.99
21	Alley running from Loc	ust St. to Chambers St., bet. 2nd	St. and Third St.	316.00	316.00	
21	Alley running from Con	cordia Ave. to Auer Ave., bet. R	ichards St. and Buffum St.	627.20	602.20	25.00
22	Elm St.	52nd St.	54th St.	1,960.00	610.00	1,350.00
22	46th St.	Meinecke Ave.	North Ave.	169.00	169.00	
23	Alley running from 32nd	Ave. to Trowbridge Ave., bet. F	rederica Pl. and Scott St.	485.95	485.95	
	Total			$26,225.65	$8,753.26	$17,472.39

Ward.	House drains and water conections.	
1	$ 133.30	$
2	112.00	.....
3	45.90	.....
4	38.00	
5	.....	.....
6	80.00	.....
7	.....	.....
8	.....	.....
9	.....	.....
10	.....	.....
11	2,187.95	5
12	71.00	.....
13	.....	.....
14	1,404.80	1,0
15	60.90	.....
16	422.50	3
17	5,629.65	2,4
18	.....	.....
19	9,078.00	1,7
20	3,764.42	4,7
21	5,883.55	3,3
22	1,580.60	4
23	.....	.....
24	1,333.50	6
25	3,579.97	3,0
----	$35,406.04	$18,4

STATEMENT OF SPECIAL ASSESSMENTS LEVIED DURING THE YEAR ENDING DECEMBER 31st, 1916.

Ward.	House drains and water conections.	Water Pipes.	Constructing cement Sidewalks	Sprinkling Streets	Flushing Streets.	Oiling Streets	Removing Dead Trees	Removing Earth from Sidewalks.	Cutting Noxious Weeds.	Removing Snow from Sidewalks.	Opening Streets and Alleys.	Vacating Streets and Alleys.	Miscellaneous.	Grand Total.	Ward.
1....	$ 133.30	$ 77.92	$ 414.62	$ 1,477.69	$ 827.11	$ 5,973.25	.....	.....	$ 218.75	$ 204.69	.....	.....	$ 2.55	$ 9,329.88	1
2....	112.00	.....	436.45	2,158.73	1,015.20	988.25	.....	.....	4.00	207.00	.....	.....	54.58	4,976.21	2
3....	45.90	.....	519.28	3,537.54	1,685.48	1,414.94	$ 8.00	.....	.....	526.85	.....	.....	86.27	7,824.26	3
4....	38.00	77.93	93.40	2,069.22	2,281.97	1,761.55	10.60	$ 33.25	27.20	189.75	.....	.....	1,264.20	7,847.07	4
5....	.....	.....	59.69	3,133.56	1,096.03	5,568.24	.....	.....	19.20	161.30	.....	.....	29.78	10,067.80	5
6....	80.00	.....	73.57	2,173.87	484.14	4,297.12	.....	.....	15.00	101.75	.....	$ 669.40	20.41	7,915.26	6
7....	.....	.....	195.43	1,393.82	521.77	3,514.77	.....	.....	14.45	78.51	.....	.....	13.25	5,732.00	7
8....	.....	.....	151.98	851.34	718.84	4,923.46	.....	.....	.....	82.60	.....	.....	.....	6,728.22	8
9....	.....	.....	149.07	1,264.48	1,014.09	2,435.44	.....	7.00	5.15	49.63	.....	.....	5.73	4,930.59	9
10....	.....	.....	332.21	1,005.44	449.12	2,234.38	.....	2.25	24.75	64.73	.....	.....	12.67	4,125.55	10
11....	2,187.95	510.41	791.42	950.51	1,333.09	3,476.11	.....	49.50	130.20	483.25	.....	.....	20.89	9,933.33	11
12....	71.00	.....	6.30	1,107.67	672.31	2,565.59	.....	7.00	60.40	141.70	.....	.....	.....	4,631.97	12
13....	.....	.....	629.20	1,065.25	469.42	3,884.99	.....	.....	59.55	133.86	.....	.....	.....	6,242.27	13
14....	1,404.80	1,063.51	89.58	1,712.02	483.95	3,285.87	.....	45.25	233.25	419.69	.....	.....	8.78	8,746.70	14
15....	60.90	.....	884.64	1,009.65	773.40	4,506.83	.....	.....	105.30	133.05	.....	.....	169.89	7,643.66	15
16....	422.50	363.00	448.12	1,554.29	519.63	4,147.81	.....	.....	80.30	106.75	.....	262.00	11.97	7,916.37	16
17....	5,629.65	2,478.69	2,514.27	2,537.13	245.86	2,243.87	.....	170.20	874.25	428.65	.....	.....	2.93	17,125.50	17
18....	.....	.....	1,496.20	2,059.31	2,014.86	4,198.57	.....	8.50	1,000.98	1,005.10	.....	.....	1,549.35	13,332.87	18
19....	9,078.00	1,707.68	545.10	1,389.97	1,146.83	6,417.53	.....	.....	283.52	297.89	$ 1,550.10	.....	.....	22,416.62	19
20....	3,764.42	4,738.40	540.27	2,029.68	1,640.33	2,342.98	.....	.....	353.07	1,133.54	2,737.01	750.00	0.24	20.029.94	20
21....	5,883.55	3,351.94	649.30	1,649.84	491.92	3,579.67	0.75	47.90	627.00	460.45	918.20	.....	47.90	17,708.42	21
22....	1,580.60	419.25	332.17	1,557.89	2.080.02	6,244.42	.....	.....	391.78	769.71	3,062.00	.....	65.91	16,503.75	22
23....	.....	.....	925.98	1,668.05	750.71	8,903.21	.....	120.50	330.37	606.50	485.95	.....	.....	13,791.27	23
24....	1,333.50	614.31	451.51	1,019.35	1,492.43	1,116.74	45.00	.....	176.30	385.00	.....	.....	.....	6,634.14	24
25....	3,579.97	3,087.54	481.72	1,845.51	712.82	6,581.63	.....	56.10	908.50	768.52	.....	.....	21.11	18,043.42	25
....	$35,406.04	$18,490.58	$13,211.48	$42,221.81	$24,921.33	$96,607.22	$ 64.35	$547.45	$ 5,943.27	$ 8,940.47	$ 8,753.26	$ 1,681.40	$ 3,388.41	$260,177.07	

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR VACATING STREETS AND ALLEYS:

Ward	STREET	FROM	TO	Benefits Assessed against property	Damages Awarded	Excess of Benefits
2	Part of State St., bet. 8th	St. and 9th St.		$ 3.00	$ 3.00	
5	Alley in Blk. 10, Walker	's Point		3.00	3.00	
6	Alley in Blk. 15, lying be	t. Walnut St. and Ship St., easte	rly of Commerce St.	869.40	200.00	669.40
16	Alley running N. and S.	bet. Cedar St. and Wells St. and	34th St. and 35th St.	262.00		262.00
18	Cambridge Ave., and No	rth Park Front, bet. Folsom Pl.	and Bartlett Ave.	1.00	1.00	
19	Part of Vliet St., bet. 50	th St. and 51st St.		12.00	12.00	
20	Part of alley running N.	and S. from Locust St. to Chamb	ers St., bet. W. 24th and 25th Sts.	2.00	2.00	
20	N. alley, rng. E. and W.	between Hadley St. and Center S	t., and 26th and 27th Sts.	750.00		750.00
21	Ring St.	1st St.	2nd St.			
	Total			$ 1,902.40	$ 221.00	$ 1,681.40

Report of the

Bureau of Street Construction and Repair

For the Year Ending
December 31,
1916.

January 15, 1917.

Mr. F. G. Simmons,
Commissioner of Public Works.

Dear Sir:—The following is a report of the Bureau of Street Construction and Repairing for the year ending December 31, 1916.

The only notable difference between the 1915 and 1916 paving program is the large increase in the bituminous concrete and the creosoted wood block yardage, and also in the eliminating of the bituminous macadam type of pavement. The yardage of bituminous concrete alleys increased from approximately 27,000 in 1915 to 96,000 in 1916, and the creosoted wood block yardage from 17,000 in 1915 to 56,000 in 1916. While bituminous concrete pavement has not as yet been laid for a sufficient length of time to show finally whether or not it will stand up under service in this climate, still, the indications are that it will give very satisfactory service, laid under the proper conditions of traffic.

Bituminous macadam streets, owing to the difficulty in getting a proper foundation and also to the difficulty of securing uniform and proper pentration of the bituminous binder, have been done away with. The cost of the bituminous concrete streets is only slightly more than that of the bituminous macadam and the bituminous concrete being machine mixed is certain to prove a much better pavement.

The most notable improvements which were made during the year were the paving of Keefe avenue from Humboldt avenue to Port Washington road, resurfacing with bituminous concrete of Layton boulevard from Greenfield avenue to Lincoln avenue and the widening of Jefferson street from Mason street to Biddle street. The widening of Jefferson street for these two blocks has considrably relieved the congesting of traffic and it would be advisable to have this widening continued north to Juneau avenue.

The total amount of pavement laid in 1916 was 470,931.77 square yards against 392,471.69 laid in 1915, being an increase of about 78,000 square yards. Of the amount laid in 1916 all but 25,357 square yards was laid on a concrete foundation. This 25,357 which was not laid on a concrete foundation represents the resurfacing of Layton boulevard, which was done by using the old macadam foundation.

The rebuilding of the streets on the south side made necessary by the elevating of the Chicago, Milwaukee & St. Paul Railway tracks has progressed very satisfactorily if we take into consideration the lateness of the season when the railroad commenced to erect their steel work. The paving of Clinton street has been completed, also the paving of Lake street and of Oregon street between Reed and Clinton streets. The subway at Greenfield avenue and at National avenue under the tracks of both the Milwaukee Road and the Northewestern Road has been completed. Reed street from Florida to Oregon has been graded to the proper subgrade,but due to the fact that the railroad did not complete the erection of its steel work until late in December, it was impossible to finish the paving of the street. A temporary pavement of three inch maple planks laid on a cinder foundation has been provided which will carry traffic very well over the winter. The contracts for paving this portion with a permanent pavement will be let this winter so that work can be started early in the spring. In connection with the track elevation work the alley between Oregon and Florida streets, lying immediately west of Reed street was also paved. A considrable amount of this work was done by city labor, contracts being let only for the paving of Clinton street, Greenfield avenue and for a portion of National avenue.

During 1916 there were replaced by permanent pavements 7.81 miles of old waterbound macadam streets, leaving 241.773 miles of waterbound macadam streets still existing inside of the city limits. The total mileage of improved streets including the waterbound macadam is 414.068 and of this amount 172.295 miles are paved with a pavement laid on a concrete foundation. The average unit price of the different types of pavement remains about the same in 1916 as in 1915. Althought the cost of labor and material was higher during the past year than it was in 1915, still the fact that the contractors were paid in cash as soon as their work was completed instead of being paid in certificates as formerly, tended to counterbalance the increased cost of labor and material. The following is a table showing in detail a comparison of the pavements laid in 1916 and 1915:

	1916	1915	Increase	Decrease
Asphalt streets	231,654.53	226,081.28	5,573.25	
Asphalt alleys	324.73	1,752,12		1,427.39
Brick streets	8,388.16	10,214.44		1,826.28
Brick alleys	12,538.16	29,337.78		16,799.62
Brick gutters	12,954.61	16,077.36		3,122.75
Bit. conc. streets	94,096.27	27,240.72	66,855.55	
Bit. conc. alleys	2,222.39		2,222.39	
Bit. mac. streets		8,890.50		8,890.50
Granite	5,196.86	7,915.41		2,718.55
Sandstone	14,455.88	25,173.94		10,718.06
Tres. Blk.	56,454.64	17,584.16	38,870.48	
Cem. conc.	31,954.54	22,703.98	9,255.56	
Limestone	686.00		686.00	
	470,931.77	392,971.69	123,463.23	45,503.15

DIVISION OF STREET REPAIRING.

Macadam Repairs: Owing to the fact that waterbound macadam nder present traffic conditions requires to be renewed at least nce every two years, it was decided to dispense with this type f maintenance work. In its place was substituted the resurfacing f the waterbound macadam streets with a two inch pentration ma-adam top. In the construction of this penetration macadam top iere was used about one gallon of bituminous binder per square ard and after this was applied and the street covered with stone iips, the top was further subjected to a treatment of about one-alf gallon of bituminous road oil per square yard. The cost of iis work averaged for 1916 about 38 cents per square yard, this icluding from two to three inches of new stone which was used i the construction of the new top. This was an increase of about 2 cents per square yard over the 1915 cost, due entirely to the icreased price of labor and material. This bituminous binder iowed a difference of one cent per gallon over the 1915 price and ie bituminous road oil a difference of three cents per gallon over ie 1915 price. Of the total cost per square yard for this bitumin-is macadam resurfacing we are assessing against the abutting roperty the cost of the oil and the labor applying it. The amount iat is charged against our fund is about 20 cents per square yard id as the cost of our waterbound macadam work averaged 12 nts per square yard, it can readily be seen that only slightly

more than one-half of the amount of bituminous macadam resurfacing can be done as compared with waterbound macadam resurfacing for the same amount of money. Necessarily the number of square yards that were resurfaced in 1916 was considerably reduced as compared with that resurfaced in 1915. The life of bituminous macadam resurfacing, however, will be at least three times that of the waterbound macadam resurfacing, consequently we are saving money.

Asphalt Repairs: The present asphalt repair plant has gotten into such condition that it has become necessary to buy a new plant in 1917. The contracts for the construction of this new plant will be let sometime in January. The new plant will be so built as to either produce new material or melt up old material. Owing to the scarcity of the old material it will be necessary, after a short time to produce new top for our asphalt repair work. The cost of the repair work in 1916 was about 4 cents per square yard more than in 1915.

Block Paving Repairs: Our block pavements on account of the small amount of money that was allowed for repair work during 1916, finished the season in probably worse condition than they were at the beginning. We have been, up to the present time unable to devote the amount of time and money to the maintaining of our block pavements as is required, consequently, we are getting into bad shape. Unless the amount of money which is available for maintaining this type of pavement in the future is increased, it means that some of our block paved streets are in such bad condition that within the next year or so they will require an entire new resurfacing of the pavement, which will involve quite a large expense upon the general construction fund and also upon the abutting property.

The amount of work done in 1916 was practically double that in 1915 and the cost was reduced 15 cents per square yard.

Stone Crusher: The stone crusher operating in 1916 produced 2,545 cubic yards of stone at a cost of $1.06 per cubic yard. The stone crusher has gotten into such condition that it will be impossible to operate it for another season. The life of a jaw crusher, which is the type that has been in use for the past three years, is so short that it is very doubtful utility to purchase one of these to crush our own stone. The only successful way of crushing stone, in my opinion, is by purchasing a small gyratory crusher and erecting it in some central location as a stationary plant. The

material then is to be hauled to the crusher from all points of the city, crushed, and then returned upon the streets. It is a question whether this can be done as cheaply as it can be purchased from stone companies. I would personally recommend that the crushing of stone be done away with in the future.

Sidewalk Repairs: During 1916 there were repaired by the sidewalk crews 78,314 square feet at an average cost per square foot of 14.7 cents. This is an increase of 2.4 cents per square foot over the cost of the 1915 work. This is partially due to the increased cost of material and also partly due to the smaller size of the repairs in each particular case. There were 1,198 repair jobs completed in 1916, which would mean an average of about 65 square feet to each job. The 1915 work averaged about 75 square feet to each job. As the cost of moving men and materials would be the same whether the job consisted of 65 square feet or 75 square feet it can be easily seen that the cost per square foot would be considerably greater on the 65 foot job than on the 75 foot job.

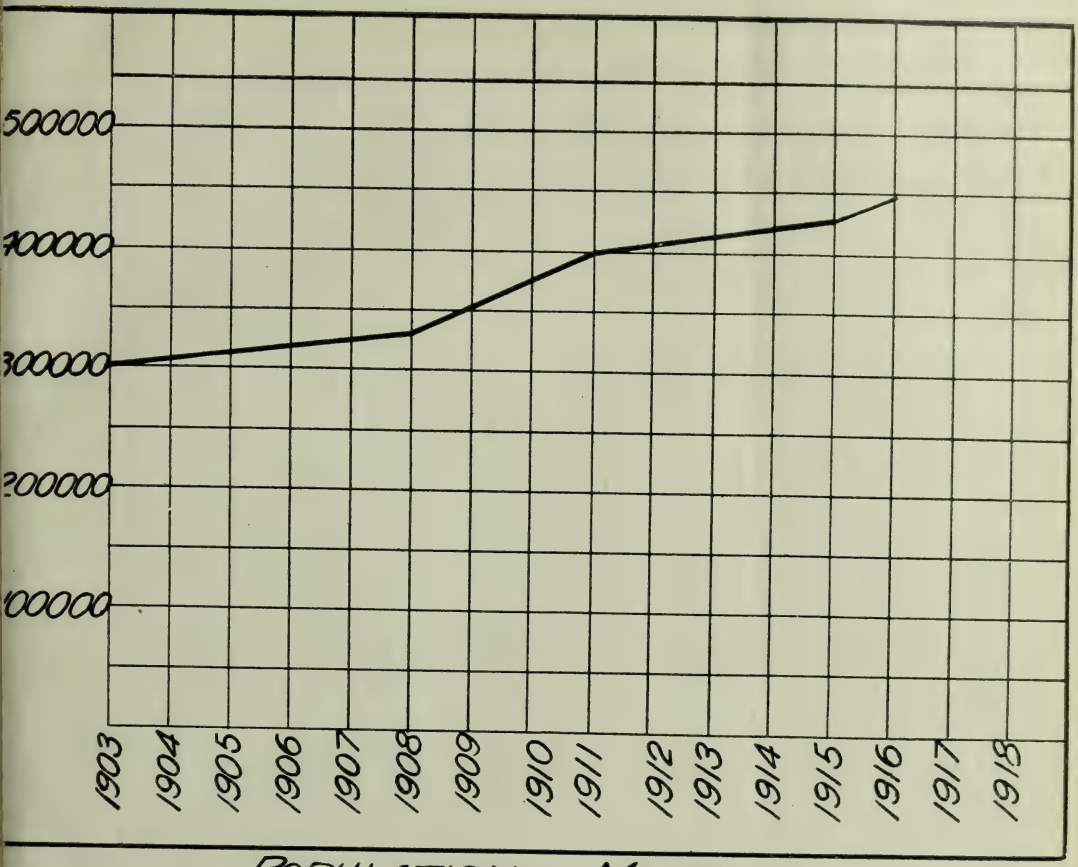
Equipment: The equipment of the Repair Devision was increased during 1916 by the purchase of one eight ton tandem roller and two 15 ton three wheel rollers. These three rollers were all driven by gas power. We also purchased a truck to be used for oiling streets and spreading bituminous binder. The truck was so built that the oiling equipment could readily be removed and replaced by an eight ton bin which renders the truck available in the winter time for hauling ashes. The following is a comparative report of the repair work between 1915 and 1916:

	Yardage	Cost per Sq. Yd.
Waterbound macadam 1915	580,653	$0.094
Waterbound macadam 1916	129,206	0.123
Bituminous macadam 1915	60,241	0.26
Bituminous macadam 1916	189,979	0.389
Asphalt pavements 1915	29,170	0.43
Asphalt pavements 1916	42,697	0.475
Block pavements 1915	18,208	0.577
Block pavements 1916	34,333	0.423

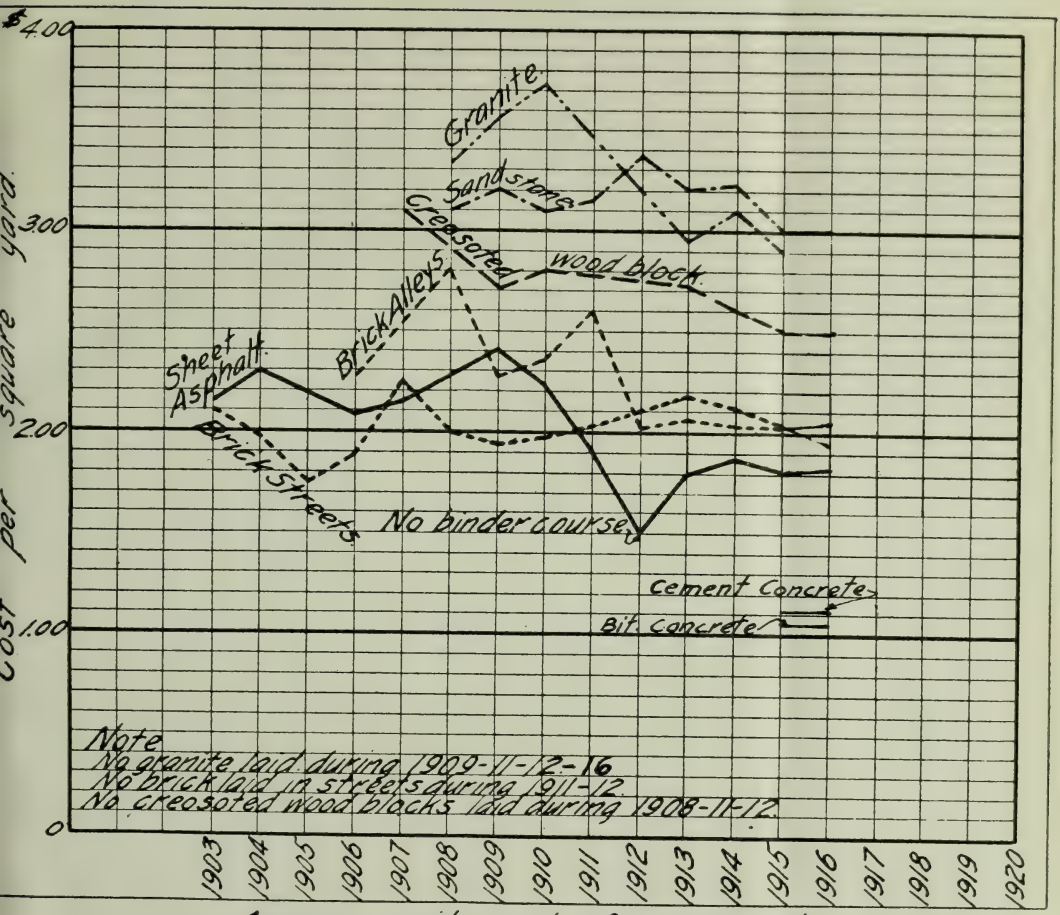
Yours truly,

FRANK W. BLODGETT,

Supt. Street Construction.

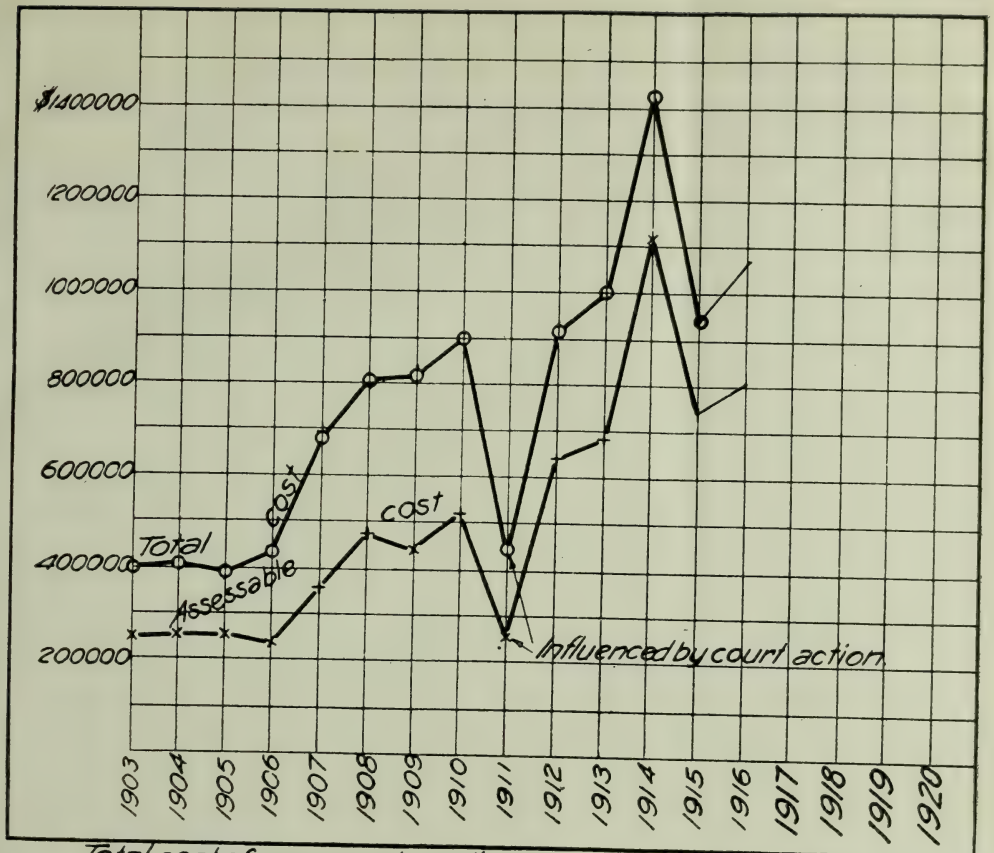


POPULATION OF MILWAUKEE
1903-1915
CHART #1.



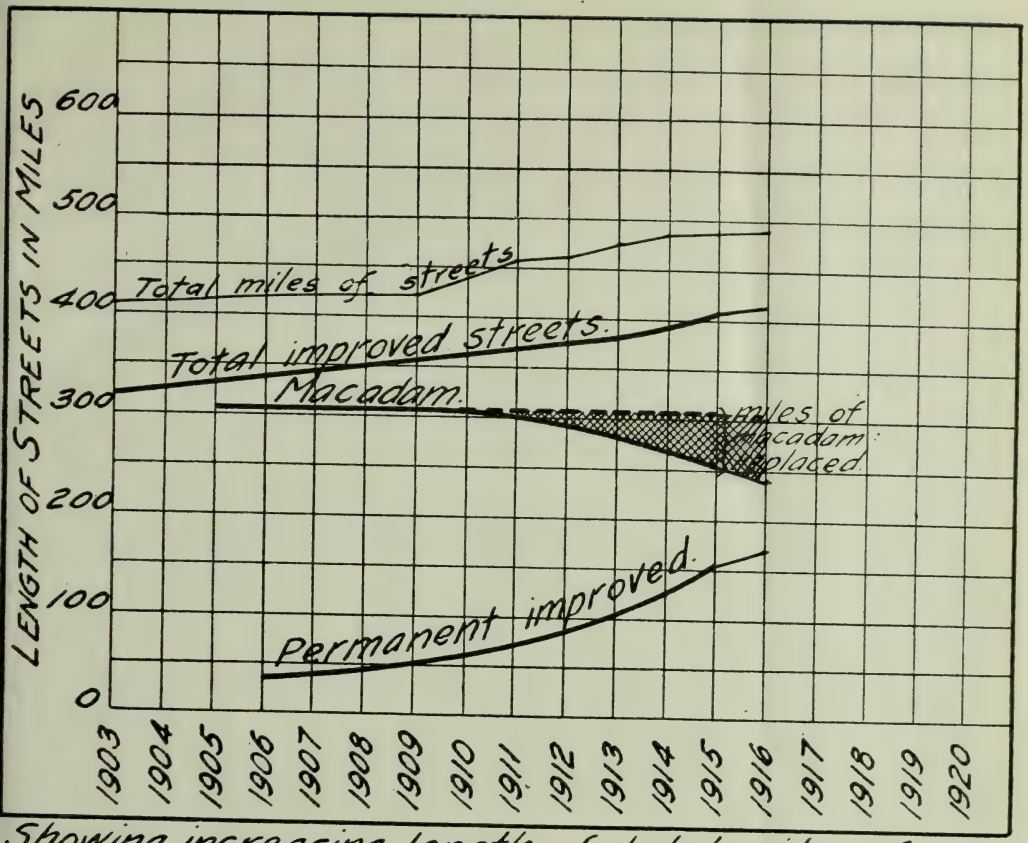
Average unit cost of pavements.

CHART # 2.



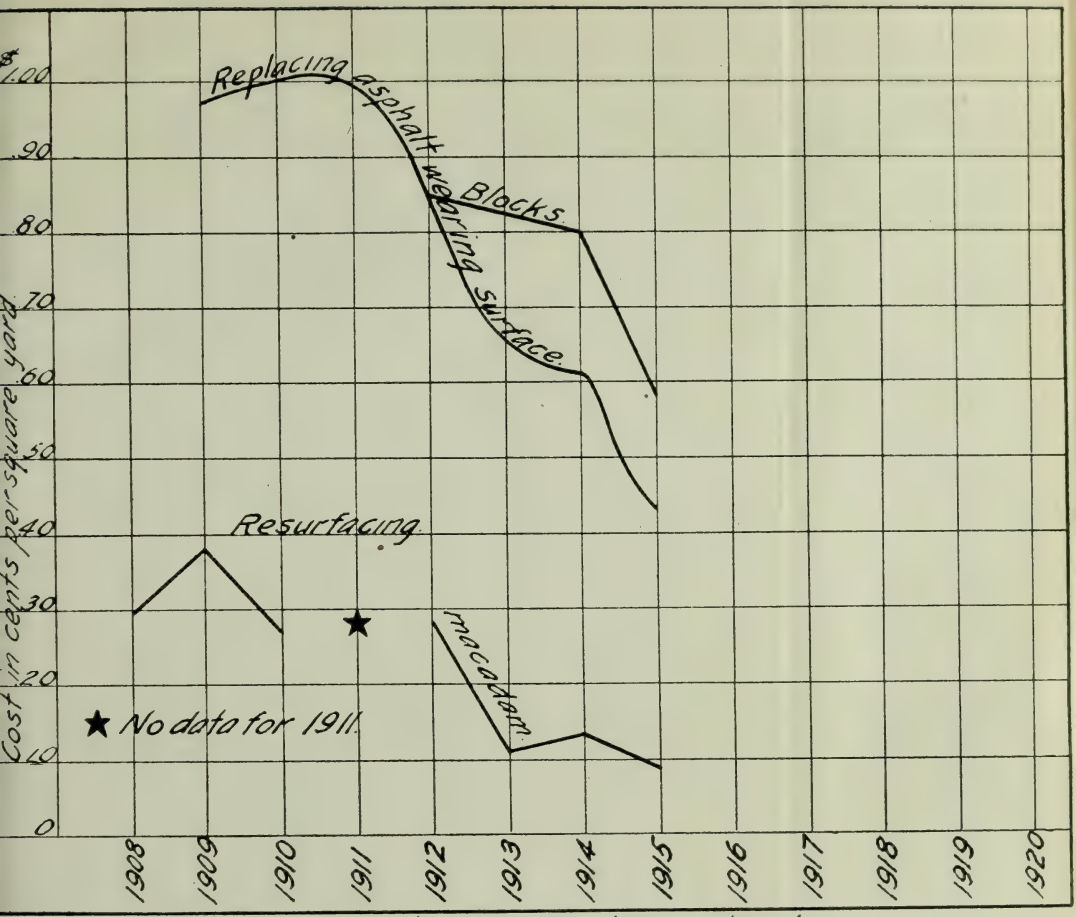
Total cost of pavements, walks, curb and gutters in city.
1903 - 1915

CHART #3



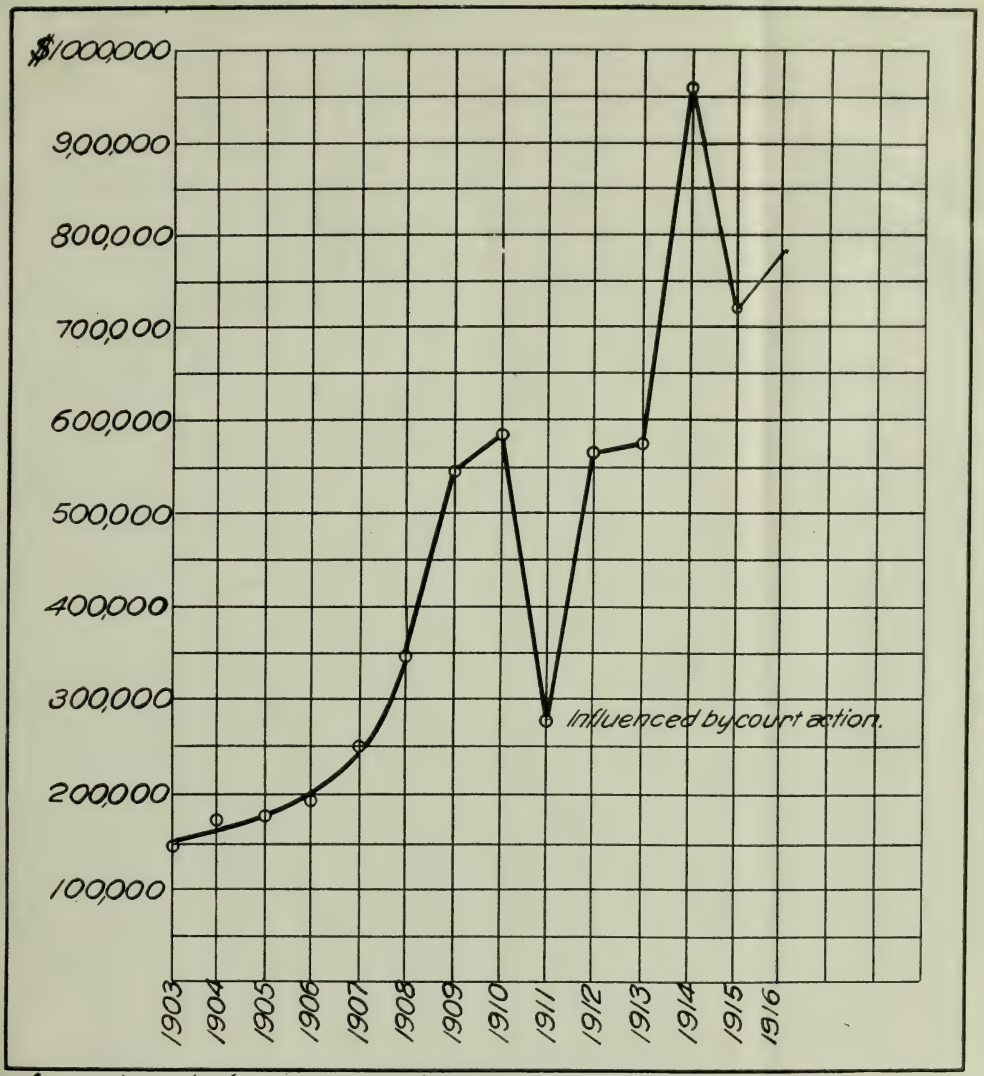
Showing increasing length of total miles of streets in city, also length of permanent (concrete base) improved streets and macadam.

CHART #4.



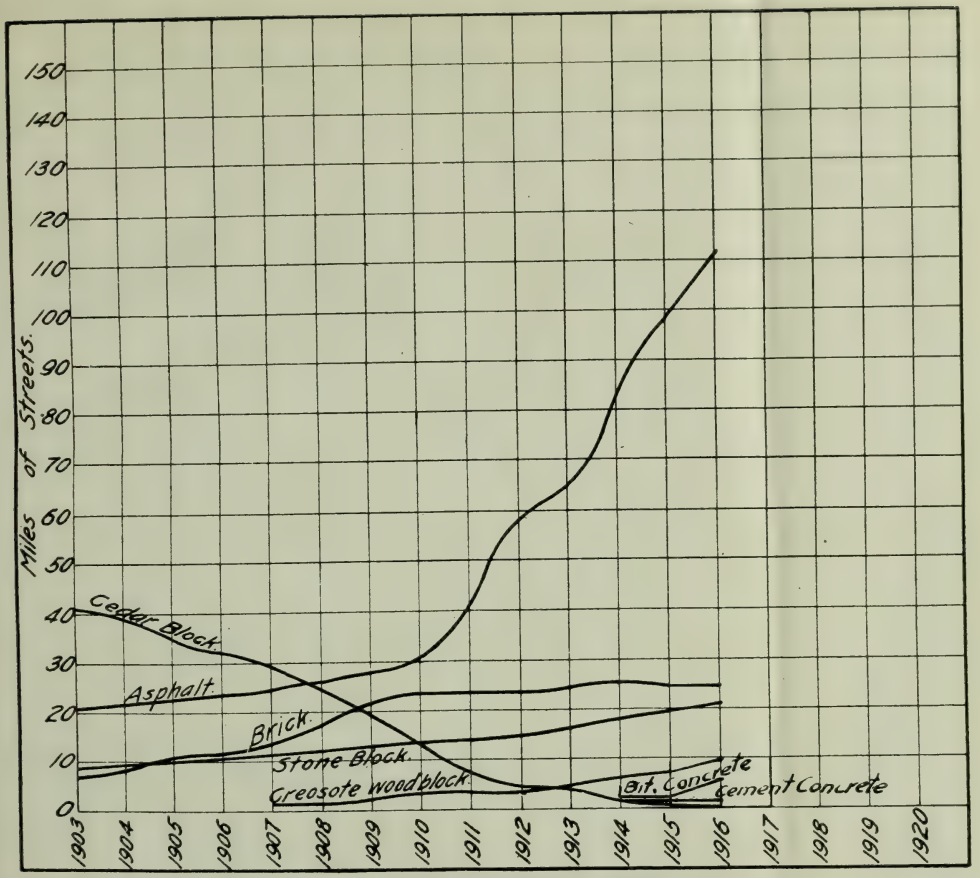
Maintenance cost per sq. yd. repaired.

CHART #5



Annual cost of permanent street pavements in city.

CHART # 6.



DEVELOPMENT OF MILWAUKEE PAVEMENTS
(EXCEPT MACADAM.)
1903 – 1915.

CHART #7

Department of Public Works

Bureau of Street Sanitation

Annual Report

1916

Milwaukee, Wisconsin, January 2, 1917.

Mr. Fred G. Simmons,
Commissioner of Public Works,
Milwaukee, Wisconsin.

Dear Sir: Following is the Annual Report of the Bureau of Street Sanitation for the year ending December 31st, 1916, showing detailed reports of the costs and statement of work performed:

(1) CLEANING STREETS AND ALLEYS.
(2) ASH AND RUBBISH COLLECTION.
(3) GARBAGE COLLECTION.
(4) COLLECTION AND REMOVAL OF DEAD ANIMALS.
(5) CATCH BASIN CLEANING.
(6) SPRINKLING.
(7) FLUSHING.
(8) OILING.
(9) SNOW REMOVAL.
(10) DUMPING GROUNDS.
(11) DRINKING FOUNTAINS.
(12) CUTTING WEEDS.
(13) ELECTION BOOTHS.
(14) ASSESSABLE SERVICE.

CLEANING STREETS AND ALLEYS—1916.

During the year of 1916, there were 31,563 loads of sweepings removed, or 94,689 cubic yards. The cost of cleaning streets and alleys for the entire year of 1916 was as follows:

Labor, $64,738.46; Team, $48,318.80; Machine, $633.86; Whiteing, $40,806.55; Total, $154,497.67.

Labor was paid at the rate of $2.00 per day for the first nine (9) months, and $2.40 per day for the last three (3) months; team at $5.00 per day.

ASH AND RUBBISH COLLECTIONS.

The following is a comparison of the yardage and cost of collection for the past six (6) years:

Wages for this work were at the rate of $2.00 per day for labor, the first nine (9) months, and $2.40 per day, the last three (3) months, and $5.00 per day for team.

1916—Collection was 333,375 cubic yards ..... Cost $216,496.62
1915—Collection was 320,373 cubic yards ..... Cost 211,939.83
1914—Collection was 321,669 cubic yards ..... Cost 226,219.24
1913—Collection was 319,848 cubic yards ..... Cost 225,421.50
1912—Collection was 293,646 cubic yards ..... Cost 229,344.26
1911—Collection was 188,737 cubic yards ..... Cost 174,619.5

1916—Average cost per cubic yard was $0.65
1915—Average cost per cubic yard was ..... .66
1914—Average cost per cubic yard was ..... .70
1913—Average cost per cubic yard was ..... .70
1912—Average cost per cubic yard was ..... .78
1911—Average cost per cubic yard was ..... .93

Comparing the cost of 1911 with that of 1916, shows a decrease of $0.27 per cubic yard.

STATEMENT OF ASH AND RUBBISH COLLECTION DURING 1916.

MONTH.	Loads.			Total cost of collection
	Dumps.	Incinerator.	Total.	
January	10,927	868	11,795	$ 21,915
February	17,198	1,038	18,236	33,855
March	10,720	564	11,284	21,436
April	11,837	334	12,171	22,617
May	9,707	530	10,237	18,843
June	6,235	313	6,548	12,532
July	2,491	222	2,713	5,138
August	2,587	170	2,757	5,119
September	4,249	6	4,255	8,985
October	5,942	.....	5,942	12,236
November	11,912	.....	11,912	25,264
December	13,275	.....	13,275	28,551
Total	107,080	4,045	111,125	$216,49
Per cent	95%	5%	100%	100%
Cost of Collection	$205,671.79	$10,824.83	$216,496.62	$216,49

1 load 3 cubic yards.
Total collection was 333,375 cubic yards.
Average cost of removal per cubic yard was $0.65.

GARBAGE COLLECTION—1916.

The following is a statement of garbage collection and comparative cost per ton for the past five (5) years. The wages paid were $3.50 per day. Each collector must bring in two (2) loads for a day's pay.

STATEMENT OF GARBAGE COLLECTION—1916.

MONTH.	Loads.	Tons.	Cost of collection
January	5,050	2,770	$ 8,683.50
February	4,507	2,336	7,726.25
March	5,228	2,795	9,040.50
April	4,734	2,656	8,284.50
May	6,071	3,426	10,430.00
June	6,277	3,604	11,012.75
July	6,457	3,825	11,114.25
August	6,896	4,145	11,810.75
September	6,400	3,870	11,275.25
October	5,869	3,422	10,122.00
November	4,972	2,654	8,575.00
December	5,277	2,636	9,282.00
Total	67,738	38,139	$117,356.75

Average load was 1,126 pounds.

Average cost of collection per ton was $3.07.

1916 Average cost per ton was $3.07
1915 Average cost per ton was 2.87
1914 Average cost per ton was 2.94
1913 Average cost per ton was 2.42
1912 Average cost per ton was 2.47

COLLECTION AND REMOVAL OF DEAD ANIMALS.

For this work we employ one permanent collector, and add a temporary collector during the warm months of the year. The wages paid are $3.50 per day. Following is a statement of the work done.

STATEMENT OF DEAD ANIMAL COLLECTION—1916.

MONTH.	Small Animals.	Large Animals.	Total.	Cost of Collection.
January	328	.....	328	$ 87.50
February	328	.....	328	87.50
March	397	.....	397	98.00
April	435	.....	435	171.50
May	443	.....	443	185.50
June	451	.....	451	185.50
July	522	.....	522	178.50
August	552	.....	552	189.00
September	404	.....	404	182.00
October	339	.....	339	182.00
November	300	.....	300	129.50
December	270	.....	270	91.00
Total	4,769	.....	4,769	$ 1,767.50

Average cost of collection per small animal was $0.37.

CATCH BASIN CLEANING.

The following is a statement of work done and itemized cost.

STATEMENT OF CATCH BASIN CLEANING DURING 1916

MONTH.	Number Cleaned.	Loads Hauled to Dump.	Cost of Cleaning.		Total.
			Labor.	Team.	
January	12	12	18.00	10.00	28.0
February	12	13	13.50	8.75	22.2
March	156	144	262.50	209.00	471.5
April	598	619	895.75	752.50	1,648.2
May	1,372	1,335	2,257.62	1,575.00	3,832.6
June	1,338	1,577	1,928.32	1,420.63	3,348.9
July	1,165	1,117	1,772.87	1,401.26	3,174.1
August	1,623	1,615	2,503.86	1,920.01	4,423.8
September	1,257	1,266	2,060.62	1,526.88	3,587.
October	118	118	237.16	793.75	1,030.
November	67	74	117.28	65.00	182.
December	16	16	27.80	22.50	50.
Total	7,734	7,906	$12,095.28	$9,705.28	$21,800

Total cubic yards of dirt removed was 15,812.
Cost of cleaning single basin was $2.82.
Average cost of cleaning and removing per cubic yard was $1.41.

SPRINKLING—1916.

During the season 295.92 miles of streets were sprinkled, at a otal cost of $63,761.36. Of this amount $42,221.81 were assess- ble; the balance, $21,539.55, was non-assessable, this being the City's portion for public property, street and alley intersections, nd cost of water. This amount was charged to the "General City Fund."

193,438,926 gallons of water were used, at a cost of $11,606.33. his includes water for car tracks (water not assessable).

The average rate of assessment per front foot was $0.014.

Charge of hydrant rent was $9,202.50 (non-assessable).

FLUSHING—1916.

During the season, 117.73 miles of streets were flushed, $24,- 21.33 was the assessment levied against abutting property; 93,- 50.125 gallons of water were used at a cost of $5,583.01 (water not ssessable).

Charge of hyrant rent was $920.25.

Average assessment per front foot was about $0.021.

OILING—1916.

During the season, 146 miles of streets were oiled. The total ost of oiling, including oil, labor, team and materials, was $108,- 55.31. Of this amount $96,607.22 were assessable, $63,482.87 for raight oiling, and $33,124.35 for resurfacing and oiling macadam reets, and $12,358.09 for non-assessable.

The non-assessable portion was for oiling street and alley in- rsections and public property.

The average rate of assessment per front foot was $0.04.

719,694 gallons of oil were used.

Contract price of oil was as follows:

-Standard Oil Company ..... $0.0492 per gallon.
-Barber Asphalt Paving Company ..... .075 per gallon.
-Barrett Manufacturing Company ..... .0575 per gallon.

Following is a comparison of street oiling during the past ght years.

During 1909— 3 miles of streets were oiled at a cost of ..... $ 1,585.85
During 1910— 16 miles of streets were oiled at a cost of 5,435.42
During 1911— 71 miles of streets were oiled at a cost of 34,891.34
During 1912— 28 miles of streets were oiled at a cost of 7,120.90
During 1913—101 miles of streets were oiled at a cost of 54,786.44
During 1914—114 miles of streets were oiled at a cost of 53,480.26
During 1915—122 miles of streets were oiled at a cost of 54,578.86
During 1916—146 miles of streets were oiled at a cost of 108,965.31

SNOW REMOVAL—1916.

The total cost of snow removal from streets, street intersections, crosswalks, gutters, and private sidewalks was $36,938.46, divided as follows:

(The assessable service was $8,059.75 for removing snow from private walks, and $880.72 for ashing sidewalks).

The City's portion for removing snow from streets, gutters and public walks was $20,349.20 for labor and $7,754.76 for team hire. Total $28,103.96.

DUMPING GROUNDS—1916.

The expense of maintaining dumping grounds is charged to Ash and Rubbish Removal.

Two dump foremen are employed at the large dumps, who have charge of the men and also keep record of loads delivered daily by ward teams. The records are used by ward foremen, when necessary, to check up team work.

The total expenses for the year were $6,162.85.

DRINKING FOUNTAINS—1916.

During the year, $563.19 were spent for new equipment. Four (4) bubblers and three (3) horse troughs were erected. $960.0 were spent for repairs during the year. Total cost of water for the year was $8,400.00. The total expense was $9,923.33.

CUTTING WEEDS—1916.

Noxious weeds growing on private property are cut down when necessary and the cost of this work is assessed to the property. This work is done by hand and machine.

During the past year $5,943.27 were spent for this purpose and sessed to the property as follows:

$216.25 for team hire (mowing machine).

$5,727.02 for labor.

ELECTION BOOTHS—1916.

This department handles all the election booths and equipment the Election Commission, whenever necessary, and the expense same is paid for by said Commission.

The expense of the 1916 election (National, State, City and unty) for erecting, maintaining and removing booths, was 961.31.

MISCELLANEOUS ASSESSMENT SERVICE.

This service is assessed to the property affected, the cost being follows:

moving earth—labor	$320.90
moving earth—team	226.55
ating nuisances—labor	46.50
ating nuisance—team	11.25
moving trees—labor	61.85
moving trees—team	2.50

Respectfully submitted,

CHAS. O. DAVIS,
Superintendent Street Cleaning.

Report of

Bureau of Bridges and Public Buildings

1916

April 9th, 1917.

Mr. F. G. Simmons,

Commission of Public Works.

Dear Sir: I herewith present my annual report for the year ending December 31st, 1916. Before taking up details of the work done and recommendations for the future, I desire again to make a few remarks regarding the organization of this Bureau. In my first annual report for the year 1912, I presented certain reorganization charts and in the year 1914, I again recommended reorganization on practically the same charts. I am still of the opinion that reorganization of this Bureau under the lines previously recommended, are exceedingly advisable and would result in greater efficiency.

I have directly under me at present, twenty-four employes or heads of various divisions. Were this office purely an administrative office, this would not be over-burdensome; but when we consider that together with this administrative feature I am directly responsible for all engineering work, which requires by me, careful analysis of all plans, specifications and construction details, it will readily be seen that it would be an advisable move to take from my direct control the sub-heads of the various public buildings and place them under a Field Superintendent of Buildings or whatever title may be best suited.

WORK DONE DURING THE YEAR.

At the end of this report you will find various tables showing in condensed form, the costs of the work done by this Bureau during the past year. These tables do not give complete details but rather summarized details. You will note in the summary table at the end, that I have given after the total of the work done, the total overhead and the overhead percent. This overhead percent is almost exactly 2 1-2 percent, which is not only in my opinion exceedingly low, but is too low to indicate proper efficiency in this office. An overhead of but 2 1-2 percent for a bureau of this kind with the number and multiplicity of activities is altogether too low. It will, for the year 1917, be higher because of the fact that I have secured more help in the office from the Common Council, which has been sorely needed for the past three years.

The overhead item includes entire costs of the Bureau Central Office including the Field Superintendent's cost and exclusive of such engineering costs of the drafting room as are devoted exclusively to individual jobs, such as the design and construction of new bridges and buildings. It also includes the costs of the Bridge Department stores, the costs of the two departmental autos, the two launches, the Bridge Department stable expenses and the cost and repair of the tools. Considering the items which it includes, I believe everyone will agree with me that it is quite low.

Table No. 1 shows the cost of the new construction including the completion of the Jackson street Natatorium, completion of Engine House No. 32, and the various other items enumerated therein. The Isolation Hospital has been progressing very slowly due largely to very numerous and in some cases, rather extensive changes which the Health Department felt were absolutely necessary in order to make the building what it should be.

The Blue Mound Sanatarium has again been started after a delay of two years. On account of this delay it was necessary that nearly all of the contractors be released from their contracts and new contracts let. This was due to the fact that the cost of both labor and material had risen very materially during that period. We are at present completing the Dining Hall at that site which will be followed by a new Power House, Administration Building and various other buildings. The plan of the entire institution has been drawn up and approved by the Health Department.

The Municipal Garage was put in shape during last year at a cost between $11,000 and $12,000. This consisted of completely remodeling the interior of the old building, rendering it practically fire-proof in accordance with the city regulations, and installing therein a gasoline system. This garage is now capable of housing 48 cars on the main floor and from 8 to 10 cars can be handled on the repair floor if necessary. This would of course rather crowd the repair floor.

A foot bridge was constructed over the C., M. & St. P. Ry Co's. right-of-way leading into Gordon Park. This bridge is a steel structure encased in concrete which gives it the appearance of a concrete bridge and renders it nearly as permanent as a concrete bridge. The cost was approximately $5,500. Considerable pains was taken in this bridge to give it a pleasing aesthetic appearance. There is still to be placed there the sidewalks leading to the bridge proper.

Although Table No. 1 shows but a small expenditure on Docks, extensive contracts were let for docks during the year 1916, which contracts are at present working. The largest of these contracts was for the construction of the dock along the south side of the Menomonee river, west of Reed street. This is the dock fronting the C., M. & S. P. Ry. Co.'s property, a corner of which they deeded to the city to improve the dock facilities at that place. The total cost of this one dock will be approximately $35,000.

In addition to this, contracts have been let for the construction of docks at the foot of East street on the east side of the Milwaukee river from the Dam to the Flushing Tunnel outlet; at the foot of National avenue on the Kinnickinnic river, and at the foot of the alley between Clybourn and Fowler street on the Milwaukee river.

Under Table No. 2, Construction Work Not Yet Started, the items of cost are mainly engineering cost and purchase of land costs. The Fifth avenue Natatorium will be built during the year 1917.

Coming to the Operation and Maintenance Costs, shown by Tables 3 and following, there is not any material differences in costs between 1915 and 1916, except in the case of the Natatoriums, Table No. 5, where there were some very extensive repairs made due to the fact that the buildings have been allowed to deteriorate considerably on account of insufficient funds heretofore.

The total costs of repairing, operating and maintaining the bridges for the year 1916 are but sightly over $1,000 greater than during the year 1915. The unit costs of repairing bridges, shown in the second part of Table No. 3, are considerably lower for the 2x3" white oak strips used in replacing roadways. For 1915 this cost was $4.62 per yard as against $3.80 for 1916. This is due largely if not entirely, to the fact that in the year 1916 the Department had a movable circular saw for cutting these strips and the saving in labor of this saw was greater than anticipated. One carpenter and a laborer were required to operate the saw and they were able to keep from 8 to 10 carpenters busy laying the roadway.

The cost of sidewalk replacements shows an increase of approximately 1 cent per square yard and the cost of painting an increase of .2 cents per square yard. These are to be expected considering the excessive cost of materials during the last year. The cost of 2-in. white oak planks which type of floor is used on certain of the swing bridges, is very much higher for 1916 than 1915, due mainly to the fact that much of this work in 1916 was

done on such bridges as State street, Clinton street and bridges crossed by the street car tracks, which requires a great deal of extra work in fitting material.

Table No. 4 shows an increase of practically $10,000 for the cost of the City Hall complete. This is due to rather extensive repairs on the elevators, including the installation of automatic limit stops, the installation of a modern lighting system in certain of the offices, together with painting of the same offices and a general increase in all work done, both in material and in labor done by other than city's forces. The Power Plant costs are about the same as the previous year.

The year 1916 being very hot, taxed the bathing facilities to the limit, particularly the bathing beaches. Steps were taken during that year to relieve this by installing voting booths at each bath house. Three voting booths were placed the 1st of August at each bathing beach and remained there until the latter part of August, when they had to be removed. These booths helped out very materially in handling the crowds, but even with them, there were long lines waiting for an opportunity to obtain a locker on every warm day—week days or Sundays.

The expenses of the Natatoriums and Bathing Beaches is as before stated, higher due to extensive repairs. Due also, to the fact that these repairs necessitated the closing of the institutions for considerable periods, the attendance records are rather low. The total receipts from the rental of bathing apparel for 1916 is $4,100 higher than for the year 1915.

The other work shown in the tables is the ordinary work recurring annually in this Bureau and needs no further mention.

FUTURE WORK.

In the line of bridges to be looked forward to in the future, I would call your attention to the fact that the City of Milwaukee is facing some exceedingly heavy expenditures to rebuild many of our old bridges which are either becoming too old to make them worth keeping in repair, or are outgrown by the present day traffic. Nearly all of our old bridges and viaducts were constructed with very narrow roadways which limits their use very exceedingly, if not rendering them dangerous to the present day traffic.

North Avenue Bridge has but a 17-ft. roadway and is crossed by a double track street car line. This bridge connecting as it does the Park systems of the City, should have at least a roadway 4(

feet wide in the clear. This bridge is to be replaced immediately with a permanent concrete structure of such design as will fit that location. $240,000 have already been secured through bond issue, for the building of this bridge but due to the changes of grade necessary to separate the street grade from the track grade just west of the bridge, the total structure will cost in the neighborhood of $400,000.

The Holton St· Viaduct will inside of the next four or five years, need replacement. This bridge is of rather light design, has but a 26 foot roadway and accommodates a double track street car line. It should in my opinion, be replaced by a permanent concrete structure similar to the North Avenue Bridge.

The 16th St. Viaduct was rebuilt in the year 1910, but is of a very light and slender construction throughout. The columns are plain I-beam columns and the trusses are of a light design, and we must look towards replacement of this bridge—work to be started in about five years. The 400 feet of this bridge crossing the Muskego Avenue Yards of the C. M. & St. P. Ry. Co., is a subject of constant worry to this office. Very extensive repairs will be needed on this section during the year 1917 due to the fact that the steel over these tracks deteriorates with alarming rapidity. Inspection last fall showed many members had been eaten clear through by rust. This bridge should be a concrete structure in order to withstand the gases from the locomotives·

Amongst the other old bridges which will within the next ten to fifteen years need replacements, are the Lincoln Avenue Swing Bridge, Point Street Swing Bridge, Chestnut St. Bridge, Clinton Street Bridge, Becher St. Bridge, Cherry St. Bridge, Pleasant St. Bridge, Huron St. Bridge and Folsom St. Bridge. The cost of replacing these bridges will amount to nearly $3,000,000. This is for replacements only and does not contemplate or include any additional bridges. The additional bridges which I estimate will be required within this time are ones connecting Cedar Street with Biddle Street, and a viaduct along the line of 35th Street; possibly also a viaduct over the Milwaukee River on the line of Kenwood Blvd. These last two bridges will probably not be needed for the next eight or ten years, though I believe I can see their need approaching at about that time.

The City Hall is at present overcrowded. I can safely say the majority of offices are considerably overcrowded and are badly in need of more room. There are but two ways of providing extra

office space, both of which I believe will be required. They are, first, alter the roof design and add a ninth floor to the building to be used for office space; second, purchase the lot at the corner of Biddle and Market streets adjoining the present Municipal Garage, and construct thereon a building to be used for the City Hall Power Plant, to increase the garage capacity and to furnish office accommodations. The total cost of these two measures would amount to approximately $150,000, and they are both needed at the present time.

Prairie St. Natatorium is in very poor and dilapidated condition. It was condemned by the Building Inspector in the year 1912, but no steps have as yet been taken to replace this building. It is one of the heaviest patronized natatoriums in the City, as Table No. 5 will show.

In addition there will be needed one or two new Natatoriums in the next five to ten years, to be placed along the outskirts of the City as our boundaries are extended. A survey made by yourself with the assistance of Mr. Tiefenthaler and me, showed quite clearly that our Natatoriums have not been placed with due respect to the districts which they should serve and I earnestly recommend that in building future natatoriums and choosing sites therefor, that this survey should be carried on more extensively in order that every new natatorium is so located that it will be used by and will serve its district to the best advantage.

Tabulated costs of the activities of this Bureau for the year 1916 are herewith appended.

Respectfully submitted,

J. C. PINNEY, JR.,

Supt. of Bridge and Public Bldgs.

TABLE NO. 1.

CONSTRUCTION.

Jackson Street Natatorium	$ 3,811.76
Isolation Hospital	82,578.78
Blue Mound Sanitorium	6,760.90
Municipal Garage	11,641.60
Engine House No. 32	2,557.78
Gordon Park Foot Bridge	5,448.35
Docks	1,233.42
Total	$114,032.59

TABLE No. 2.

CONSTRUCTION NOT YET STARTED.

State Street Bridge	$ 12,472.66
North Ave. Bridge	97.51
West Side Police Station	10.55
5th Avenue Natatorium	4,416.05
Total	$ 16,996.77

TABLE No. 3.
BRIDGE COSTS.

BRIDGE	Operation.	Roadways.	Sidewalks.	Machinery.	Superstruct.	Substruct.	Houses.	Electrical.	Total Maint.	Grand Total.
Total Bascules	$55,625.86	$ 877.39	$ 179.16	$ 2,230.30	$ 699.61	$ 1,503.55	$ 1,283.63	$ 1,121.28	$ 7,894.92	$ 63,520.68
Total Swing	25,898.99	550.50	166.16	412.80	1,837.90	381.50	169.69	470.40	3,988.95	29,877.94
Total Stationary	7,051.07	1,752.21	217.65		241.27		9.50	62.84	2,283.47	9,334.54
Grand Total	$88,575.92	$ 3,180.10	$ 562.97	$ 2,643.10	$ 2,778.78	$ 1,885.05	$ 1,462.82	$ 1,654.52	$14,167.34	$102,743.26

BRIDGE REPAIRS.

Item.	Sq. Yds.	Total Cost.	Unit Cost
Roadway Replaced with 2 x 3-in. W. O. Strips	1,354	$ 5,148.34	$3,803
Roadway Replaced with 2-in. W. O. Planks	518	824.08	1.591
Roadway Replaced with Creosoted Blocks	3,500	7,667.28	2.191
Sidewalks Replaced with 2-in. Creo. Planks	3,008	2,629.99	0.874
Painting	43,670	5,194.24	0.119
Total		$21,463.93	

TABLE No. 4.
CITY HALL COSTS.

	Total.	Unit of Measure.	No. of Units.	Unit Cost.
Heat	$ 9,542.95	Sq. ft. Radiation Surface	22,220	$0.429
Electricity (S. B. Cost)	7,367.07	K. W. Hours	303,118	0.024
Elevators	13,386.56	Elevator Miles	28,023	0.478
Cleaning and Caretaking	16,515.18	Sq. ft. Office Space	100,250	0.164
Electric Lighting	3,532.09			
Plumbing System	745.56			
General Operation	7,026.79			
Miscellaneous Repairs	5,285.65			
Total	$63,401.85	Sq. ft. Office Space	100,200	$0.632

TABLE No. 5.

BATHING BEACHES AND NATATORIA COSTS.

	Gen. Operation.	Heat.	Repairs.	Gross.	Receipts.	Net.	Attendance.	Net Cost per bather.
Center St. Natatorium	$ 2,800.06	$ 1,836.90	$ 3,456.35	8,093.31	648,85	7,444.46	70,311	$0.106
Jackson St. Natatorium	2,459.55	1,937.99	430.74	4,828.28	753.20	4,075.08	43,786	0.093
Greenbush St. Natatorium	4,192.70	1,982.29	1,347.07	7,522.06	2,074.60	5,447.46	85,752	0.063
Greenfield Ave. Natatorium	4,340.47	2,006.78	148.47	6,495.72	1,811.50	4,684.22	116,750	0.040
North Ave. Natatorium	4,067.78	2,417.77	1,537.70	8,023.25	715.70	7,307.55	91,456	0.080
Prairie St. Natatorium	4,479.54	2,325.73	1,138.90	7,944.17	2,128.50	5,815.67	103,345	0.056
McKinley Park B. H.	5,359.47	.....	1,528.09	6,887.56	1,874.00	5,013.56	* 87,800	0.057
South Shore B. H.	4,167.01	.....	900.08	5,067.09	1,583.90	3,483.19	* 94,400	0.037
Totals	$31,866.58	$12,507.46	$10,487.40	$54,861.44	$11,590.25	$43,271.19	693,600	$0.062

* Estimated.

TABLE No. 6.

MISCELLANEOUS COSTS.

Comfort Station	478.25
Central Market	3,032.75
Garage	470.22
Street Lighting	250,323.50
Preventorium	218.57
Work done for other Departments	3,571.00
Odd Jobs	185.69
Total	$258,279.98

SUMMARY.

Construction	$114,032.59
Construction (Planned)	16,996.77
Bridge Operation and Maint.	102,743.26
Bridge Repairs	21,463.93
City Hall	63,401.85
Bathing Stations	54,861.44
Miscellaneous	258,279.98
Total	$631,779.82
Total Overhead	$ 16,185.61
Overhead Percentage	2.5

Annual Report

of the

Superintendent of Plumbing and House Drain Laying

ANNUAL REPORT OF THE SUPERINTENDENT OF PLUMBING AND HOUSE DRAIN LAYING.

Milwaukee, Jan. 15th, 1917.

Mr. F. G. Simmons,

Commissioner of Public Works.

Dear Sir: I respectfully submit herewith the annual report of the Department of Plumbing and House Drain Laying for the year ending December 31st, 1916. The attached table shows the divisions of the City into nine districts and the number of men employed.

Respectfully submitted,

GEO. R. STOLZ, Supt.

CON. ZARTNER, Dep'y.

REMARKS.

Inspector R. Hasselkus regularly stationed in East Division ssisted in office during January, compiling the annual report nspector Wm. Smith of the South Division being transferred to ast Division. Work in South Division being done by inspector . Horsch and F. Balbi up to April 17th, when A. W. Starck entered ne service to succeed Inspector R. Hasselkus who severed his onnections with the bureau on Feb. 1st, 1916.

STATEMENT OF COST OF CONTRACT HOUSE DRAIN AND WATER CONNECTION INSPECTIONS AND SPECIAL HOUSE DRAIN INSPECTIONS.

MONTH.	Salaries Paid.	Reimbursements.	Profits on Special Inspections.	Addition to Fund.	Net Cost.
January	.....	.....	.....	.....	.....
February	.....	.....	.....	.....	.....
March	.....	.....	.....	.....	.....
April	$ 432.00	.....	.....	.....	$ 432.0(
May	618.00	.....	.....	.....	618.0(
June	426.00	28.60	2.60	.....	397.4(
July	230.00	.....	.....	.....	230.0(
August	196.00	.....	.....	.....	196.0(
September	84.00	.....	.....	.....	84.0(
October	.....	.....	.....	.....	.....
November	.....	.....	.....	.....	.....
December	52.00	.....	.....	.....	52.0(
Totals	$2,038.00	$28.60	$2.60	.....	$2,009.4

Add to Fund	.....
Net cost of Inspection	$2,009.4

RECAPITUALTION.

**Cost of Contract House Drain and Water Connection Insp.....	$2,012.0
Profit on Special Inspections	2.6
Net Cost of Inspections	2,009.4

**City is reimbursed for all special inspections by house drain layer for whom such inspections are made.

REPORT OF CONTRACT DRAINS AND WATER CONNECTIONS AND COST OF INSPECTION THEREOF IN THE FOLLOWING DESCRIBED STRETS DURING THE YEAR 1916.

STREET.	FROM	TO	CONTRACTOR.	INSPECTOR.	COST.
		WEST SIDE.			
Auer Ave.	Achilles St.	1st St.	W. T. Werner	A. Holzhausen	$ 4.00
Cedar St.	13th St.	9th St.	G. Zimmermann	A. Kraatz	12.00
Center St.	Holton St.	Humboldt Ave.	W. T. Werner	A. Holzhausen	4.00
Center St.	Fond du Lac Ave.	30th St.	A. Hohensee	A. Kraatz	6.00
Center St.	32nd St.	36th St.	A. Hohensee	A. Kraatz	58.00
Cherry St.	54th St.	Hawley Rd.	W. T. Werner	A. Holzhausen	12.00
Chestnut St.	12th St.	18th St.	H. Hohensee	A. Kraatz	Canceled
Clybourn St.	27th St.	35th St.	H. Hohensee	A. Kraatz	38.00
Concordia Ave.	Booth St.	Humboldt Ave.	F. J. Smith	Ed. Wettig	No ch'ge
Elm St.	49th St.	52nd St.	H. Hohensee	A. Kraatz	20.00
Galena St.	49th St.	Hawley Rd.	W. T. Werner	A. Halzhausen	28.00
George St.	Richard St.	North Pierce St.	W. T. Werner	A. Holzhausen	8.00
Holton St.	Burleigh St.	Hadley St.	F. J. Smith	A. Holzhausen	28.00
Hopkins St.	Chambers St.	Teutonia Av.	W. T. Werner	A. Holzhausen	16.00
Hopkins St.	Keefe Ave.	27th St.	A. Kehrein	Ed. Lierman	28.00
Keefe Ave.	Humboldt Ave.	Pt. Washington Rd.	F. Goll	Wm. Voelz	136.00
Lisbon Ave.	North Ave.	City Limits	eo. Zimmermann	A. Kraatz	12.00
Locust St.	29th St.	Fond du Lac Ave.	Geo. Zimmermann	C. Stuckert	10.00

STREET.	FROM	TO	CONTRACTOR.	INSPECTOR.	COST.
Louis Ave.	Nash St.	Atkinson Ave.	F. A. Goll	Wm. Voelz	12.00
North Ave.	48th St.	53rd St.	A. Kehrein	Ed. Lierman	30.00
Pabst Ave.	54th St.	55th St.	W. T. Werner	H. Wirth	5.50
Ring St.	Richard St.	2nd St.	A. Kehrein	Wm. Voelz	18.00
Vine St.	52nd St.	55th St.	F. J. Smith	C. Stuckert	6.00
Vliet St.	Hawley Rd.	City Limits	Geo. Zimmermann	C. Stuckert	4.00
Walnut St.	3rd St.	4th St.	Geo. Zimmermann	C. Stuckert	5.00
Washington Blvd.	53rd St.	City Limits	Geo. Zimmermann	C. Stuckert	8.00
Weil St.	Auer Ave.	Burleigh St.	F. J. Smith	H. Wirth	92.00
14th St.	Nash St. to 60 ft. S. of..	Atkinson Ave.	A. Kehrein	A. Holzhausen	28.00
16th St.	Nash St.	Finn Pl.	H. Hohensee	Wm. Nern	No ch'ge
17th St.	Ring St. to N. line of....	Teutonia H'ts.	G. Zimmermann	A. Holzhausen	44.00
17th St.	Davis St.	Finn Pl.	J. L. Hahn	A. Kraatz	72.00
18th St.	Davis St.	Finn Pl. Exted.	G. Zimmermann	A. Halzhausen	28.00
22nd St.	Hopkins St.	Keefe Ave.	F. J. Smith	Edw. Wettig	No ch'ge
26th St.	Pease St.	Franklin St.	W. T. Werner	A. Holzhausen	12.00
30th St.	Concordia Ave.	Townsend St.	G. Zimmermann	C. Stuckert	64.50
33rd St.	Burleigh St. to N. line	of Climax Sub.	W. T. Werner	A. Holzhausen	24.00
35th St.	Vliet St.	Lloyd St.	F. J. Smith	H. Wirth	56.00

STREET.	FROM	TO	CONTRACTOR.	INSPECTOR.	COST.
39th St.	Clarke St.	Center St.	F. J. Smith	A. Holzhausen	4.00
50th St.	Vliet St.	Washington Blvd.	F. A. Goll	Wm. Voelz	22.00
51st St.	Washington Blvd.	Vine St.	F. J. Smith	H. J. Wirth	16.00
52nd St.	Vliet St.	Washington Blvd.	F. J. Smith	H. J. Wirth	94.50
52nd St.	Washington Blvd.	Vine St.	F. A. Goll	Wm. Voelz	22.00
53rd St.	Vliet St.	Vine St.	F. A. Goll	Wm. Voelz	74.00
54th St.	Vliet St.	Washington Blvd.	G. Zimmermann	C. Stuckert	18.50
				Total	$ 1,224.00
8th St.	Atkinson Ave.	Graham St.	Contract let	Work not started	
Sherman Blvd.	Wright St.	Center St.	Contract let	Work not started	
Hawley Rd.	Pabst Ave. to S. line of	Nee Skara H'ts.	Contract let	Work not compl't'd	36.00
				Total	$ 1,260.00
		EAST SIDE.			
Kenilworth Pl.	Terrace Ave.	Prospect Ave.	H. Hohensee	A. Kraatz	16.00
Knapp St.	Jackson St.	Astor St.	W. T. Werner	A. Holzhausen	4.00
				Total	$ 20.00

STREET.	FROM	TO	CONTRACTOR.	INSPECTOR.	COST.
		SOUTH SIDE.			
2nd Ave.	Windlake Ave.	Lincoln Ave.	Geo. Zimmermann	C. Stuckert	$ 6.00
5th Ave.	Cleveland Ave. to R. O.	W. Ry Co.	F. J. Smith	H. Wirth	18.00
7th Ave.	Cleveland Ave. to R. O.	W. Ry Co.	W. T. Werner	A. Holzhausen	12.00
14th Ave.	Hayes Ave.	Arthur Ave.	W. T. Werner	A. Holzhausen	12.00
16th Ave.	Maple St.	Greenfield Ave.	T. Holton	A. W. Stark	4.00
19th Ave.	Rogers St.	Greenfield Ave.	G. Zimmermann	A. W. Stark	16.00
21st Ave.	Lincoln Ave.	Rogers St.	T. Holton	A. W. Stark	7.00
26th Ave.	Lincoln Ave.	Hayes Ave.	W. T. Werner	A. Holzhausen	4.00
28th Ave.	Greenfield Ave.	Lapham St.	W. T. Werner	A. Holzhausen	12.00
29th Ave.	Greenfield Ave.	Lapham St.	W. T. Werner	A. Holzhausen	16.00
30th Ave.	Greenfield Ave.	Lapham St.	G. Zimmermann	A. Kraatz	32.00
31st Ave.	Greenfield Ave.	Lapham St.	A. Kehrein	A. Holzhausen	16.00
American Ave.	Cleveland Ave. to R. O.	W. of Ry. Co.	W. T. Werner	A. Holzhausen	28.00
Arthur Ave.	26th Ave.	Layton Blvd.	G. Zimmermann	A. W. Stark	13.00
Cleveland Ave.	American Ave.	11th Ave.	G. Zimmermann	C. Stuckert	5.00
Deer Pl.	Howell Ave.	West St.	F. J. Smith	H. Wirth	42.00
Delaware Ave.	Oklahoma Ave. S. to ..	City Limits	G. Zimmermann	C. Stuckert	21.00
Hanover St.	Harrison to N. line of..	reserved Lot V.	G. Zimmermann	C. Stuckert	17.00

STREET.	Plumbing Inspected.	Total Cost Per Month.
Harrison St.		
Hayes Ave.		
Howell Ave.		
New York Ave.		
Pennsylvania Ave		
Superior St.		
Wyoming Pl.		
Menlo Blvd.		
Stowell Ave.		
Dahlman Ave.		
Olive St.		
Frederick St.		
Jarvis St.		
Kensington Blvd		
Farwell Ave.		
Kensington Blv		
Frederick St.		

*The City of Milwaukee collects a fee of Five [illegible]

CIT

A
twe
fro
Sou
par

.21

TABLE SHOWING BOUNDARY LINES AND NUMBER OF INSPECTIONS MADE IN THE VARIOUS DIVISIONS OF THE CITY OF MILWAUKEE.

[illegible] Districts	All that part lying East of the Milwaukee River including the Village of East Milwaukee
DIVISIONS	EAST DIVISION
INSPECTORS	Wm. Smith

MONTHS	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection
January	84	22	19	2	1.09
February	97	39	27	3	.85
March	135	54	30	7	.61
April	216	231	61	29	.26
May	191	268	35	33	.25
June	96	134	18	16	.50
July	165	105	21	12	.43
August	162	200	32	29	.32
September	161	188	33	25	.33
October	198	272	28	28	.24
November	138	291	27	24	.27
December	121	191	30	23	.37
Total Plumbing Inspt	1766				
Total Drain Inspection		1998			
Total Plumbing Rejetd			367		
Total Drain Rejetd				231	
Percentage Plumbing Rejections			207		
Percentage Drain Rejections				.115	
Percentage Total Rejt			158		
Average Time Min Per Inspt				23.7	
Average Cost per Inspection					366
Total per Year	3764		598		

WEST DIVISION	All that part bounded South by Menomonee River, North by Galena St., East by Milwaukee River, West to and including a part of Wauwatosa					All that part lying North of Clarke St. and West of 20th St.				
INSPECTORS	P. J. King					Edw. Wettig				
MONTHS	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection
January	81	24	8	1	1.09	71	18	8	2	.97
February	67	17	[illegible]	2	1.37	57	16	17		1.57
March	86	50	6	7	.85	64	79	13	2	.80
April	96	102	18	9	.58	99	291	17	12	.29
May	89	99	8	5	.61	112	239	11	13	.33
June	158	110	30	7	.39	62	123	2	13	.62
July	114	116	9	4	.50	101	216	23	17	.36
August	131	121	9	5	.46	119	185	50	18	.38
September	149	101	20	10	.46	127	199	21	16	.35
October	150	103	17	3	.45	92	211	15	21	.38
November	149	117	17	14	.39	91	261	16	21	.33
December	121	59	11	8	.64	57	199	6	22	.45
Total Plumbing Inspt	1391					1052				
Total Drain Inspection		1079					2067			
Total Plumbing Rejetd			159					199		
Total Drain Rejetd				75					157	
Percentage Plumbing Rejections			114					189		
Percentage Drain Rejections				069					075	
Percentage Total Rejt			.094					111		
Average Time Min Per Inspt				30					26	
Average Cost per Inspection					558					.442
Total per Year	2470		234			3119		356		

WEST DIVISION	All that part lying West of 20th St. bounded on the South by Galena St. and on the North by Clarke St.					All that part lying North of Galena St. bounded on the East by the Milwaukee River and on the West by 7th St.					All that part lying North of Galena St. and bounded on the East by 7th St. and on the West by 20th St.				
INSPECTORS	A. G. Barsch					L. A. Mehner					W. G. Nein				
MONTHS	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection
January	51	17	10	1	1.14	42	13	18	1	1.53	77	59	10	6	.85
February	70	26	15		1.20	47	8	11		2.09	18	13	7	1	1.89
March	81	16	18	5	.88	72	26	9	1	1.17	82	29	10	7	1.03
April	102	207	23	12	.37	98	118	20	16	.53	94	115	11	8	.55
May	127	177	27	11	.38	93	120	15	8	.54	152	152	28	11	.38
June	96	181	10	21	.42	140	130	26	17	.43	124	233	18	6	.32
July	106	162	18	5	.43	110	100	28	10	.55	75	74	16	1	.77
August	105	81	20	5	.61	63	56	12	10	.97	110	120	13	5	.50
September	59	67	16	6	.91	136	113	32	25	.41	101	104	16	9	.57
October	88	118	15	11	.49	118	80	35	6	.58	139	131	28	1	.43
November	77	105	14	6	.63	82	84	24	15	.39	61	70	7	2	.86
December	62	91	23	1	.75	81	66	15	17	.78	91	129	23	3	.52
Total Plumbing Inspt	1030					1102					1157				
Total Drain Inspection		1341					911					1226			
Total Plumbing Rejetd			209					248					190		
Total Drain Rejetd				90					126					66	
Percentage Plumbing Rejections			202					225				163			
Percentage Drain Rejections				067					1 33				053		
Percentage Total Rejt			126					182				104			
Average Time Min Per Inspt				33					25 61					31	
Average Cost per Inspection					.582					674					.579
Total per Year	2371		299			2046		374			2383		256		

SOUTH DIVISION	All that part lying West of 11th Ave. from the Menomonee River, South to and including parts of West Milwaukee, Town of Greenfield and Town Lake					All that part lying between 1st and 11th Ave. from the Menomonee River, South to and including a part of Town Lake					All that part lying East of 1st Ave. from the Menomonee River South to and including a part of Town Lake				
INSPECTORS	J. J. Hotsch					A. W. Starck					F. C. Ballo				
MONTHS	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection
January	55	37	10	1	1.25						67	40	16	4	1.07
February	89	30	12	1	.97						89	33	20	3	.94
March	92	79	4	17	.67						96	79	14	3	.66
April	108	179	9	6	.40	49	116	5	10	.28	124	181	20	15	.38
May	178	300	30	15	.24	169	313	5	5	.22	110	178	22	11	.40
June	129	176	25	6	.38	152	266	3	6	.28	103	140	13	12	.47
July	58	92	9	7	.77	125	133	3	1	.15	61	99	9	9	.71
August	185	227	22	11	.28	89	177	7	1	.43	102	168	20	11	.43
September	167	151	18	8	.36	140	158	5	4	.39	42	99	8	13	.82
October	166	214	18	9	.30	106	135	4		.48	86	171	18	16	.45
November	130	168	24	26	.39	104	108	1	3	.51	125	128	25	16	.45
December	93	171	22	15	.44	76	69	6		.79	70	68	15	2	.83
Total Plumbing Inspt	1450					1010					1078				
Total Drain Inspection		1827					1535					1384			
Total Plumbing Rejetd			233					39					200		
Total Drain Rejetd				122					30					118	
Percentage Plumbing Rejections			16					.038					.185		
Percentage Drain Rejections				066					019					085	
Percentage Total Rejt			.108					.027					129		
Average Time Min Per Inspt				249					21.9					33.7	
Average Cost per Inspection					.421					382					56
Total per Year	3277		355			2545		69			2462		318		

RECAPITULATION	Total Plumbing Inspections	Total Drain Inspections	Total Inspections	Total Plumbing Rejections	Total Drain Rejections	Total Rejections Per Month	Percentage Plumbing Rejections	Percentage Drain Rejections	Percentage Total Rejections	Average Time Minutes Per Inspection	Average Monthly Cost Per Inspection	Total Cost Per Month
January	550	290	840	99	21	120	178	072	143	17	$ 1.23	$1,035.00
February	564	152	716	118	10	128	209	054	171	17	1.23	920.00
March	741	412	1153	104	49	153	146	110	133	11	.80	920.00
April	986	1570	2556	190	117	307	192	074	12	24	.38	973.67
May	1224	1876	3100	181	121	302	147	064	097	23	.33	1,035.00
June	1060	1523	2583	145	104	249	136	067	096	24	.40	1,035.00
July	918	1097	2015	139	69	208	152	062	103	27	.51	1,035.00
August	1066	1338	2404	185	95	280	173	071	116	28	.43	1,035.00
September	1082	1210	2292	169	116	285	156	095	124	24	.45	1,035.00
October	1143	1165	2608	208	95	303	182	061	116	26	.40	1,035.00
November	960	1362	2322	155	127	282	161	093	121	27	.60	1,035.00
December	772	1046	1818	151	91	242	195	085	13	31	.45	1,035.00
Total Plumbing Inspt	11036											
Total Drain Inspection		13401										
Total Plumbing Rejetd				1814								
Total Drain Rejetd					1015							
Percentage Plumbing Rejections							167					
Percentage Drain Rejections								076				
Percentage Total Rejt									117			
Average Time Min Per Inspt										27.7		
Average Cost per Inspection											.496	
Total per Year		24437			2859							12,128.67

DIVISIONS.	Plans Approved.	Plans Cancelled During 1916.	Plans Inspected and Approved of Previous Years				Plans Unfinished of Previous Years.				
			1916	1915	1914	1913	1916	1915	1914	1913	1910
West	2361	23	1918	353	7	1	443	15			1
East	571	7	460	116	3	1	111			1	
South	1559	18	1381	169	2		178	3	1	2	
Town Lake	9		6				3				
East Milwaukee	102		57	38	3		45	2			
West Milwaukee	106		101	10	7		2				
Town Greenfield	35		29	1			6				
Town Wauwatosa	40		21	1			19				
Total	4783	48	3976	691	22	2	807	20	1	3	1

ORGANIZATION.

Superintendent of Plumbing and House Drains	$1,800.00
Dep'ty Supt. of Plumbing and House Drains	1,500.00
Nine Field Inspectors	12,128.67
Jr. Clerk Stenographer	685.16
Total	$16,113.83

STREET.	FROM	TO	CONTRACTOR.	INSPECTOR.	COST.
Harrison St.	Hanover St.	Greenbush St.	G. Zimmermann	A. Kraatz	32.00
Hayes Ave.	Forest Home Ave.	26th Ave.	G. Zimmermann	C. Stuckert	11.00
Howell Ave.	City Limits	4th St.	F. Goll	F. Balbi	No ch'ge
New York Ave.	Delaware Ave.	City Limits	F. Goll	Wm. Voelz	24.00
Pennsylvania Ave.	Beulah Ave.	City Limits	F. J. Smith	A. Holzhausen	16.00
Superior St.	Oklahoma Ave.	City Limits	F. A. Goll	Wm. Voelz	64.00
Wyoming Pl.	Pennsylvania Ave.	Kinnickinnic Ave.	F. J. Smith	A. Holzhausen	72.00
				Total	$ 500.00

EAST MILWAUKEE.*

Menlo Blvd.	Maryland Ave.	Oakland Ave.	F. A. Goll	Wm. Voelz	$ 42.00
Stowell Ave.	Intersection of	Oak St.	W. T. Werner	A. Holzhausen	4.00
Dahlman Ave.	Oakland Ave.	Murray Ave.	G. Zimmermann	A. Kraatz	
Olive St.	Oakland Ave.	Downer Ave.	G. Zimmermann	A. Kraatz	
Frederick St.	Beverly Rd.	Mineral Rd.	G. Zimmermann	A. Kraatz	52.00
Jarvis St.	Oakland Ave. thence..	East	G. Zimmermann	A. Kraatz	
Kensington Blvd.	Frederick St. to	W. F. Bay Rd.	G. Zimmermann	Ed. Liermann	
Farwell Ave.	Kensington Blvd.	Lake Bluff	G. Zimmermann	Ed. Liermann	93.50
Kensington Blvd.	Cramer St.	Frederick St.	A. Kehrein	A. Kraatz and)	
Frederick St.	North of Kensington B	lvd.	A. Kehrein	(E. Lierman	40.50
				Total	$ 232.00

*The City of Milwaukee collects a fee of Five ($5.00) Dolalrs per connection to pay for inspection and clerical work.

REPORT OF HOUSE DRAIN AND WATER CONNECTIONS DONE UNDER PRIVIATE CONTRACTS AND FOR WHICH INSPECTION IS PAID BY LAND OWNER OR DRAIN LAYER.

EAST MILWAUKEE.

STREET.	FROM	TO	CONTRACTOR.	INSPECTOR.	COST.
Downer Ave.	Edgewood Ave.	Menlo Blvd.	C. Lindner	Wm. Voelz	
Hackett Ave.	Edgewood Ave.	Newton Ave.	C. Lindner	Wm. Voelz	
Summitt Ave.	Edgewood Ave.	Menlo Blvd.	C. Lindner	Wm. Voelz	
Shephard Ave.	Edgewood Ave.	Lake Dr.	C. Lindner	Wm. Voelz	
Lake Dr.	Shephard Ave.	Menlo Blvd.	C. Lindner	Wm. Voelz	
Menlo Blvd.	Downer Ave.	Lake Drive	C. Lindner	Wm. Voelz	
Newton Av.	Downer Ave.	Lake Drive	C. Lindner	Wm. Voelz	
Cramer St.	Edgewood Ave.	Menlo Blvd.	A. Kehrein	A. Kraatz	
Vietor Ave.	Oakland Ave.	Maryland Ave.	A. Kehrein	A. Kraatz	
Oak St.	Maryland Ave.	Oakland Ave.	A. Kehrein	A. Kraatz	
Cramer St.	Norwood Ave.	Beverly Rd.	A. Kehrein	A. Kraatz	
Beverly Rd.	Oakland Ave.	Prospect Ave.	A. Kehrein	A. Kraatz	
*Milwaukee St. No. 486			D. Polacheck	Ed. Lierman	$ 26.00

*Soil in these premises not of sufficient stability to admit of open trench work, thus necessitating the employment of a special inspector to be paid for by the Drain Layer at the rate of 55 cents per hour.

Report of

Purchasing Department

For the Year Ending
December 31,
1916

April 4th, 1917.

Mr. Percy Braman,

Dept. Commissioner of Public Works.

Dear Sir: I submit, herewith, a report of the Bureau of Purchases and Supplies, for the year ending December 31st, 1916.

I have divided the report into two statements, as follows:

Statement No. 1 shows the number of requisitions and amount of supplies and materials furnished the various departments and bureaus from store stock.

Statement No. 2 shows the number of requisitions and amount of supplies purchased by the Purchasing Bureau for various departments and bureaus. This, however, does not include materials, supplies, etc., purchased by formal contract.

Inventory taken December 31st, 1916, shows that we are carrying a stock on hand amounting to about $25,000.00.

I do not think it is necessary to go into detail regarding the work this bureau is doing, as I believe the attached reports are sufficient.

Thanking all departments and Bureaus for their co-operation and you for your valuable help and suggestions, I am

Yours respectfully,

WM. R. CALLAHAN,

Chief Clerk.

No. 1.

REQUISITIONS ISSUED BY THE VARIOUS DEPARTMENTS TO THE STORES DEPARTMENT DURING THE YEAR 1916.

Department—	No. of Requisition—	Amount
Bridges and Buildings	675	$ 5,804.24
Building and Elevator Inspector	56	1,003.95
City Attorney	66	230.52
City Clerk	173	465.37
Comptroller	42	224.22
Engineers Bureau	217	1,809.91
Engineer Examiners	25	84.00
Fire Department	266	4,589.14
Fire and Police Alarm System	357	4,562.00
Fire and Police Commissioner	1	.4
Health Department	832	4,194.3
Johnston Emergency Hospital	68	510.5
Mayor	30	82.9
Municipal Research Bureau	87	208.3
Municipal and District Court	33	110.8
Plumbing Bureau	22	29.2
Police Department	90	1,207.9
Public Works Assessment	48	46.0
Public Works Audit and Accounts	45	94.3
Public Works Commissioner	30	96.1
Public Works Harbor Master	3	9.6
Public Works Harbor Commissioner	11	11.2
Public Works Illumination	57	110.7
Public Works Purchases	11	179.1
Public Works Stores	11	25.1
Public Works Power Plant	104	1,203.8
Public Works Street Lights	9	4.9
Sewer Department	159	3,645.6
Smoke Inspector	21	90.1
Street Construction	774	2,825.5
Street Sanitation	637	5,118.7
Tax Commissioner	55	221.2
Treasurer	58	288.3
Water	644	4,577.0
Weights and Measures	28	332.6
	5,745	$43,999.0

No. 2.

NUMBER OF REQUISITIONS AND AMOUNT OF SUPPLIES PURCHASED BY THE PURCHASING DEPARTMENT FOR VARIOUS DEPARTMENTS FOR THE YEAR 1916.

Department—	No. of Requisition—	Amount
Bridges and Public Buildings	1,601	$53,678.85
Building Inspector	86	1,726.33
City Attorney	184	2,599.93
City Clerk	366	25,248.77
City Engineer	294	3,526.77
Comptroller	101	5,765.86
Engineer Examiners	37	385.94
Fire	1,775	65,746.80
Fire and Police Alarm	573	18,278.16
Fire and Police Commission	6	45.45
Harbor Commission	18	350.30
Harbor Master	10	77.27
Health	2,075	51,784.65
Illumination Bureau	147	9,193.51
Johnston Emergency Hospital	357	8,705.06
Justice of the Peace	1	5.00
Mayor	50	601.23
Municipal Court	80	1,140.47
Municipal Research Bureau	114	929.52
New Lighting	24	508.76
Plumbing Inspector	13	277.16
Police	485	24,402.09
Public Works—Assessment	22	797.50
Public Works—Chief Clerk	33	363.29
Public Works—Commissioner	135	6,585.31
Purchasing	20	132.60
Stores	621	52,020.64
Sewer	554	47,033.40
Smoke Inspector	17	86.45
Special Sewerage	233	13,068.53
Street Construction	1,649	102,074.51
Street Sanitation	876	17,915.91
Tax Commissioner	74	1,088.75
Treasurer	74	3,239.20
Water	1,438	52,578.20
Weights and Measures	61	1,232.08
	14,204	$573,194.25

Report of

City Engineer

For the Year Ending
December 31,
1916

January 31st, 1917.

Mr. F. G. Simmons,

Commissioner of Public Works.

Dear Sir: In compliance with the requirements of the City Charter, I herewith submit to you the report of the operations of the Bureau of Engineers for the year ending December 31st, 1916.

BUREAU OF ENGINEERS.

George F. Staal	City Engineer.
Ed. F. Leidel	Chief Engineer.
Edw. F. Petersik	Senior Clerk Stenographer
Gustave Janzer	Junior Clerk Stenographer
Fred Hornbach	Senior Engineer
E. L. Knebes	Senior Engineer
A. H. Schneider	Senior Engineer
J. C. Berenson	Senior Engineer
J. C. Baumgartner	Junior Engineer
W. F. Hunt	Junior Engineer
H. Nelson	Junior Engineer
Wm. Hanus	Junior Engineer
L. Glasgow	Instrumentman
Geo. Kysely	Rodman
W. Kuechle	Rodman
P. Kannenberg	Rodman
L. Heinze	Rodman
W. Pendergast	Rodman
G. A. Uhlmann	Structural Draftsman
B. P. Schaefer	Structural Draftsman
F. W. Schultz	Draftsman
J. Sikorra	Draftsman
Geo. Eigner, Jr.	Draftsman
Frank Nahrath	Chief Estimate Clerk
O. E. R. Ludovici	Asst. Estimate Clerk
A. F. Bussian	Asst. Estimate Clerk

STREETS AND ALLEYS.

The streets and alleys improved during the year 1916 are a follows:

Total length of streets improved	25.442 mil
Total length of streets paved	19.652 mil
Total length of alleys paved	4.791 mil

The total cost of street and alley improvements amounted to $1 069,354.24 of which amount $801,861.58 was assessed against abu ting property as benefits. The improvements made during th year 1916 and the cost thereof, are shown by the following stat ment:

STREET IMPROVEMENTS.

Excavation	134,460.00	cu. yds.	$83,481.
Filling	45,065.24	cu. yds.	19,347.
Scarifying Roadway	25,358.72	sq. yds.	2,039.
Cement Concrete	239.02	cu. yds.	1,203.
Cement Concrete pavement removed	1,905.18	sq. yds.	381.
Cement Concrete pavement	2,110.75	sq. yds.	2,342.
Cedar Block pavement removed	3,216.42	sq. yds.	160.
Asphalt pavement	208,711.53	sq. yds.	384,763.
Asphalt Resurfaced	4,218.59	sq. yds.	7,440.
Asphalt Wearing Surface removed	4,444.07	sq. yds.	1,679.
Asphalt Pavement removed	4,976.16	sq. yds.	2,612.
Brick pavement	8,388.16	sq. yds.	17,082.
Brick re-paved	12.00	sq. yds.	3.
Brick pavement removed	1,917.18	sq. yds.	154.
Creosoted Wood Block Pavement	52,477.65	sq. yds.	129,607.
Bituminous Concrete Pavement	94,096.27	sq. yds.	99,444.
Sandstone Block Pavement	11,642.88	sq. yds.	34,566.
Granite Block Pavement	1,621.83	sq. yds.	3,065.
Binder	6.30	cu. yds.	47.
Brick Gutter Pavement	12,694.48	sq. yds.	31,667.
Limestone Gutter repaved	1,331.80	sq. yds.	532.
Cement Gutter	1,260.50	lin. ft.	560.
Flagstone relaid	57.40	sq. ft.	14.
Cement Driveway	759.34	sq. ft	118.
Straight Stone curb	45,437.78	lin. ft.	32,649.
Radius Stone Curb	6,881.99	lin. ft.	6,571.
Stone Curb re-set	40,894.08	lin. ft.	4,552.
Stone Curb removed	226.00	lin. ft.	22.

Concrete Curb	4,152.85	lin. ft.	2,374.80
ombination Cement Curb and Gutter	74,650.40	lin.ft.	32,796.89
omb. Cement Curb and Gutter reset	1,930.85	lin. ft.	414.24
ement Curb and Gutter removed	3,004.36	lin. ft.	413.45
ement Sidewalks	676,048.34	sq. ft.	69,974.56
ement Sidewalks removed	8,151.67	sq. ft.	256.49
idewalks re-set	9,724.15	sq. ft.	616.73
rain Tile	1,093.18	lin. ft.	98.39
Beams removed	28		20.00
oncrete Retaining Wall	53.09	cu. yds.	530.90
			$973,609.61

ALLEY IMPROVEMENTS.

xcavation	14,715.00	cu. yds.	$10,782.65
lling	1,035.00	cu. yds.	544.10
ement Concrete	79.14	cu. yds.	395.70
ement Concrete pavement	29,388.62	sq. yds.	35,530.64
edar Block pavement removed	358.57	sq. yds.	89.64
sphalt pavement	324.73	sq. yds.	353.96
sphalt pavement removed	705.76	sq. yds.	211.73
rick pavement	12,538.16	sq. yds.	24.483.98
rick re-paved	19.77	sq. yds.	6.92
reosoted Wood Block pavement	705.76	sq. yds.	1,870.26
tuminous Concrete pavement	2,222.39	sq. yds.	3,111.35
rick Gutter pavement	260.13	sq. yds.	634.62
obblestone pavement removed	2,904.93	sq. yds.	561.03
rain Tile	30,823.35	lin. ft.	3,956.57
			$82,533.15

WORK DONE BY CITY CREWS.

lling	270.00	cu. yds.	
ment Sidewalks	77,614.37	sq. ft.	
ment Driveways	1,164.27	sq. ft.	
ment Sidewalks Raised	5,848.80	sq. ft.	
ment Sidewalks Chipped	19.59	sq. ft.	$13,211.48
ment Sidewalks Patched	205.93	sq. ft.	
ment Gutter	20.80	lin. ft.	
one Curb Reset	33.00	lin. ft.	
ncrete Curb	132.80	lin. ft.	
ment Curb and Gutter	98.20	lin. ft.	
Grand Total			$1,069,354.24

The following streets were paved with asphalt under a con tract given by abutting property owners:

			Sq. Yds
36th St.	Center St.	Burleigh St.	6,25
37th St.	Center St.	Hadley St.	1,45
38th St.	Center St.	Hadley St.	1,45
39th St.	Center St.	Hadley St.	1,45
40th St.	Center St.	Hadley St.	1,45
41st St.	Center St.	Hadley St.	1,47
42nd St.	Center St.	Locust St.	4,63
46th St.	Clarke St.	Meinecke Ave.	2,88
Clarke St.	45th St.	46th St.	69
Wright St.	46th St.	a pt. 123 ft. West	29
52nd St.	Vine St.	a pt. 367 ft. South	87
		TOTAL	22,94

Total length—1.686 miles.

Table showing miles of the various street pavements taken u and laid during the year 1916, and the total miles of paved stree at the end of the years 1915 and 1916.

Kind of Pavement	Miles taken up during 1916	Miles laid during 1916	Total miles at end of 1915	Total mil at end o 1916
Cement Concrete	0.	0.12045	0.87556	0.996
Cedar Block	0.21557	0.	0.21557	0.
Creosoted Wood Block	0.	2.58195	7.36854	9.950
Granite Block	0.06193	0.06193	11.22588	11.225
Sandstone Block	0.	0.50720	8.40664	8.913
Brick	0.11648	0.44920	24.67512	25.007
Asphalt	0.47926	12.52895	98.10858	110.158
Bituminous	0.	5.08769	0.95473	6.042
Total	0.87324	21.33737	151.83062	172.294
Macadam	7.80991		252.71862	241.773
Grand Total	8.68315	21.33737	404.54924	414.067

At the end of the year 1916 there were 490,000 miles of stree within the city limits, of which 414.068 miles are improved, 5.7 miles are to grade and have sidewalks and 75.932 miles are uni proved.

MILES OF ALLEY PAVEMENT.

Total length of alleys paved during 1916	4.79082 miles
Total length of alley pavement removed during 1916	0.56865 miles
	4.22217 miles
Total length of paved alleys at the end of 1915	115.77736 miles
Total length of paved alleys at the end of 1916	119.99953 miles

The following ordinances and estimates have been prepared during the year:

Estimates for improving streets and alleys	325
Ordinances for establishing the grade on streets	102
Ordinances for establishing the grade on alleys	123
Ordinances for establishing the width of roadways	2
Ordinances for establishing the width of sidewalks	43
Ordinances for establishing the grade of sidewalks	14
Profiles—establishing grades	282
Sketches or plans for street and alley improvements	492
Plans for house drain and water services	63
Certificates issued for street and alley improvements	167

AREA OF CITY.

	Sq. Miles
The area of the city January 1st, 1900	21.15
The area of the city January 1st, 1905	22.37
The area of the city January 1st, 1910	22.63
The area of the city January 1st, 1915	25.72
The area of the city January 1st, 1916	25.85
The area of the city January 1st, 1917	25.85

LENGTH OF STREETS.

At the end of the year 1915, the total length of streets in the City of Milwaukee amounted to 487.213 miles.

During the year 1916 there were added:

By anenxation	miles
By platting	2.244 miles
By condemnation	0.388 miles
By deed	0.155 miles
Total of new streets	2.787 miles
Total at end of 1916	490.00 miles

WATER PIPE.

Plans and profiles were made, line and grade given for laying 27,300 feet or 5.17 miles of water pipe of sizes ranging from six to twelve inches in diameter, as follows:

6 inch	23,385 feet
6 inch H. P.	421 feet
8 inch	2,949 feet
12 inch	545 feet

A complete report of the costs of the laying of water pipe, etc will be found in the report of the Superintendent of Water Works

SEWERS.

No contracts for the construction of sewers were let until th latter part of July, during 1916, on account of the controversy a to the legality of the Sewer Bond Issue. Despite the delay in th commencement of the work, and the scarcity of labor, most of th minor sewers, urgently needed were completed before the seaso closed.

Section No. 1 of the Lake Street Sewer Tunnel contract fo which was let during 1915, was completed at a cost of $162,912.4

Contracts for work completed during the year included 38,6 lineal feet of 8, 12, 15 and 18 inch cement or clay pipe sewer 7,363 lineal feet of 21, 24, 27, 30, 48 and 54 inch reinforced concre pipe sewers and 10,137 lineal feet of 72, 78 and 84 inch monolith concrete sewers.

The Sewer Department, in addition to the flushing and cleani of sewers, repairs to and setting to grade of manholes, built 21 ma holes and 1,400 catch basins during the year. In addition to t sewers laid and accepted during the year 1916, amounting 9.988 miles, at a cost of $255,134.00, there were laid 55 lineal feet 18 inch pipe and 362 lineal feet of 15 inch pipe sewer and 15 lineal feet of 12 inch sewer by the Bureau of Sewers.

Up to the end of 1915 there were built 487.47 miles of sewer a cost of $7,046,741.03 making at the end of 1916 a total of 498.4 miles at a cost of $7,303,241.43.

The total length of sewers, including intercepting sewers, co structed by the City of Milwaukee up to the end of the year 19 was 498.475 miles as follows:

2.048 miles of	8 inch pipe
180.390 miles of	12 inch pipe
174.036 miles of	15 inch and 18 inch pipe
0.441 miles of	21 inch reinforced concrete pipe
1.005 miles of	24 inch reinforced concrete pipe
0.390 miles of	27 inch reinforced concrete pipe
1.366 miles of	30 inch reinforced concrete pipe
0.679 miles of	36 inch reinforced concrete pipe
0.262 miles of	48 inch reinforced concrete pipe
0.014 miles of	54 inch reinforced concrete pipe
14.083 miles of	24 inch brick
42.926 miles of	30 inch brick or monolithic concrete
19.062 miles of	36 inch brick or monolithic concrete
9.441 miles of	42 inch brick or monolithic concrete
8.994 miles of	48 inch brick or monolithic concrete
5.495 miles of	54 inch brick or monolithic concrete
6.503 miles of	60 inch brick or monolithic concrete
4.220 miles of	66 inch brick or monolithic concrete
6.366 miles of	72 inch brick or monolithic concrete
2.465 miles of	78 inch brick or monolithic concrete
2.754 miles of	84 inch brick or monolithic concrete
0.125 miles of	90 inch brick or monolithic concrete
3.397 miles of	96 inch brick or monolithic concrete
2.718 miles of	120 inch brick or monolithic concrete
9.295 miles of	intercepting sewers

The largest diameter of sewers built is 120 inch and the smallest diameter is 8 inch. There are 89 outlets for sewers into the Milwaukee, Menomonee and Kinnickinnic rivers, and four outlets into Lake Michigan. These sewers have 23,357 manholes and 14,666 catch basins; there are also 74,665 house drains connected with the sewers.

All work completed during the year, including laying of sewers, water pipe, house drain and water services, has been entered on the proper departmental records.

VACATIONS AND CONDEMNATIONS OF LAND.

Maps and descriptions of lands proposed to be condemned for highway or other purposes were made, also for the vacations of streets or alleys, as follows:

CONDEMNATIONS.

Street or Alley	From	To	Ward.
Vienna Ave.	Green Bay Ave.	11th St.	25
School site			15
School site			21
17th St.	Concordia Ave.	Davis St.	25
18th St.	Davis St.	Teutonia Ave.	25
School site			13
School site			21
Atkinson Ave.	6th St. and Green Bay Ave.	a point bet. 9th & 10th Sts	25
Alley running N. & S.	Blk. 1, Stuewe's Subd.	Blk. 2, H. Vogt's	20
Alley running E. & W.	S. of Lot 6, Blk. 1, Stuewe's Subd. between Chambers and Locust Sts. and between 25th and 26th Sts.		20
Vliet St.	W. line of 40th St.	E. line Washington Park	19
School site			17
Davis St.	Green Bay Ave.	Port Washington Rd.	21

VACATIONS.

Street or Alley	From	To	Ward
S. Menomonee Canal	Muskego Ave.	A pt. W. of Muskego Ave	23
Alley running N. & S.	Bet. Wells and Cedar St., and bet. 34th and 35th sts.		16
Becker's Lane	S. line of Hillside Lane	R. O. W. C. M. & St. P. Ry	15
Part of Ring St.			21
Windlake Ave.	1st St.	2nd St.	24
Part of Pine St.	Fifteenth Ave.	Cleveland Ave.	17
Part of alley Blk. 6	Russell Ave.	Montana St.	24
	Trowbridge Park Cont.		

LAKE LEVELS.

The following tables, made up from the daily records, show the stages of water levels of the lake and rivers for each month of the year, and the means and extremes since the year 1896. These elevations refer to the city datum line as a base, which is 580.75 feet above mean tide at New York City.

STAGE OF WATER IN RIVERS AND LAKE DURING 1916.

Month.	Highest	Lowest	Mean
January	—0.4	—1.1	—0.826
February	—0.5	—0.9	—0.752
March	—0.1	—0.9	—0.602
April	—0.1	—0.7	—0.506
May	-|-0.1	—0.5	—0.282
June	-|-0.4	—0.4	-|-0.013
July	-|-0.1	—0.1	—0.027
August	-|-0.2	—0.2	—0.097
September	—0.1	—0.7	—0.28
October	—0.1	—0.7	—0.293
November	-|-0.2	—0.6	—0.225
December	—0.0	—0.7	—0.322

Highest	-|-0.4
Lowest	—1.1
Average Mean	—0.349

Year.	Highest	Lowest	Mean
1916	-|-0.4	—1.1	—0.349
1915	0.0	—1.2	—0.6105
1914	-|-0.200	—1.500	—0.489
1913	-|-0.300	—1.500	—0.6119
1912	-|-1.700	—2.900	—0.7939
1911	—0.600	—2.900	—1.809
1910	—0.300	—2.600	—1.497
1909	-|-0.800	—3.000	—0.242
1908	—1.100	—1.500	—0.482
1907	-|-1.000	—1.100	-|-0.960
1906	-|-1.100	—0.900	-|-0.070
1905	-|-1.000	—1.200	—0.020
1904	-|-1.500	—1.360	—0.140
1903	-|-0.230	—1.730	—0.660
1902	0.000	—2.200	—1.010
1901	-|-0.400	—1.900	—0.690
1900	—1.100	—2.300	—0.940
1899	-|-0.400	—2.200	—0.900
1898	0.000	—2.700	—0.980
1897	—0.100	—2.300	—1.160
1896	—1.100	—2.800	—1.810

WATER WORKS.

LINWOOD AVENUE INTAKE SYSTEM.

SHORE TUNNEL.

The shore tunnel was completely finished by O'Brien & Jackson Co. in every detail on October 3rd, 1916, final acceptance having been recommended on that date. However, the mining operations were completed on August 19th, 1916, and the tunnel concreting was ended on August 30th. The North drift from Shaft No. 1 was the last drift to be finished. The total length of the tunnel is 5,644.38 feet, 4,405.38 lineal feet having been built in 1916.

The total cost of the tunnel, exclusive of non-contract extras, was $299,590.42. In 1916, $234,404.51 represented the total money earned. The average total cost of the tunnel per lineal foot was $53.08. In the total cost, the individual items were as follows:

Item No. 1—5,644.38 lineal feet of completed tunnel at $41.90 totalling $236,499.52;

Item No. 2—1,134.053 cu. yds. of concrete backing beween the B. & C. lines at $7.00 totalling $7,938.37;

Item No. 3—5,934.049 barrels of Portland Cement grout at $3.25 totalling $19,285.65;

Item No. 4—Constructing 5,195.48 lineal feet of tunnel under compressed air at $6.00 totalling $31,166.88;

Item No. 5—Furnishing, placing and removing 1 safety bulkhead totalling $500.00;

Item No. 6—Furnishing, placing and removing 3 sets of air locks $4,200.00;

The concreting backing averaged 0.201 cu. yds. per lineal foot and $1.41 per lineal foot. The grouting averaged per lineal foot—1.05 barrels and $3.42. The additional cost of compressed air averaged per lineal foot of the total length $5.52.

The total cost of engineering and inspection was $13,199.00. In 1916, this cost was $8,928.00. This total cost averaged $2.34 per lineal foot of tunnel. The City Organization consisted of 6 construction inspectors, 2 engineering inspectors, 1 transitman, 1 draftsman and 1 resident engineer.

It is very gratifying to note that no lives were lost and no serious injuries resulted from this large construction operation.

The construction methods and results were excellent. Great credit is due to the city inspectors for the high quality of the work.

EXTENSION OF THE LINWOOD AVE. INTAKE TUNNEL.

The city assumed charge of the first 4,000 feet of the tunnel and also of the pumping operations on this section on May 10th, 1916, the water department having previously purchased various plant from Jos. Hanreddy for pumping purposes. The City conducted this pumping until June 24th, or a total of 45 days. This total cost was $2,486.36 averaging $55.25 per day.

The bids for the Extension of the Linwood Avenue Intake Tunnel were opened March 8th, 1916. The O'Brien and Jackson Construction Co· were the lowest of 7 bidders, their total being $476,652.50.

The contract was awarded to them and signed March 20th. On June 23rd, 1916, the new contractors assumed charge of pumping operations. On May 24th, preparatory operations were started. On July 21st, 1916, first work on the contract work was inaugurated, under Item No. 3. On September 11th, blasting out the concrete bulkhead at Station 40-|-13.7 was started. Mining operations were commenced September 14th.

Up to 8 A. M. January 1st, 1917, the following progress has been made: 917.8 lineal feet of excavation and 793.8 lineal feet of completed arch and sidewalls combined. The open base of the originally proposed lake shaft (from station 39-|-78·8 to 40.03.3) has been concreted. Grouting over this section was placed to the extent of 173.5 barrels. Up to date, the contractor has earned $92,760.08 of which sum $78,846.06 have been paid him. Construction operations have been conducted satisfactorily. No serious injuries have resulted.

MISCELLANEOUS.

This office this past year surveyed and mapped a new base line for locating the proposed submerged lake crib. The plans for the tunnel extension were also prepared in this office.

RIVER SURVEY.

During the past year the survey of the Rivers and Harbor has been extended to the Menomonee River and its Canals. Actual field work was started from that time until cold weather set in, during December. The survey located all existing docks, bounding

street lines and all improvements between the river and the bounding street lines.

The field work was not completed during the year, but enough data was obtained to prepare maps of the greater part of the area. It is expected that the remaining field work will be completed within two months and that the maps will be completed within two months thereafter.

During the course of the year, several independent surveys of the Milwaukee and Menomonee rivers were made for the construction of new docks and for proposed changes to existing established dock lines. The most important work was the widening of the Menomonee river, west of Reed street.

TRACK ELEVATION AND DEPRESSION.

A number of hearings and conferences were held during the year with reference to the separation of the grades on the "Beer Line." The city does not anticipate an order providing for the separation of the grades of all that part of the "Beer Line" within the city at this time, but an order providing for the separation of the grades at North avenue and Humboldt avenue is momentarily expected.

Such work as was done by this department in connection with the separation of the grades on the Madison Division of the Chicago and Northwestern Railway consisted of assisting the Railroad Commission at a number of conferences in working out various details pertaining to this work. The final order providing for the separation of grades of this line, it is anticipated, will be issued within a short time.

During the year 1916, the work of separating the grades in the district between the Milwaukee river and the Kinnickinnic river was practically completed. About $3,500,000 was spent by the Chicago, Milwaukee & St. Paul Railway and the Chicago, & Northwestern Railway in separating the grades on this part of their lines.

In connection with the separation of the grades on the Northwest side, the Northern Division of the Chicago, Milwaukee & St. Paul Railway, the only activities to be recorded for the year consist of hearings before the Railroad Commission in relation to the method of restoring side track facilities. Nothing has occurred, however, to lead one to believe that there would be any delay in the commencement relative to the separation of grades on this line.

FINANCIAL.

BUREAU OF ENGINEERS—CITY ENGINEER.

Budget Appropriation	$ 4,140.00
Service Trans. Vouchers 1, 3, 4, 6, 8, 11, 12, 16, 18, 20, 24, and 25 (Water Dept.)	2,000.00
	$ 6,140.00

EXPENDITURES.

Permanent Service	$ 5,919.99	
Office Supplies	101.37	
Minor Repairs		
Postage	25.00	
Street Car Fare		
General Service	10.00	
Official Bond	25.00	
	$ 6,081.36	
Balance	58.64	
	$ 6,140.00	

ENGINEERING DIVISION.

Budget Appropriation	$36,818.00
Service Trans. Vouchers 2, 5, 7, 9, 10, 13, 14, 15, 17, 19, 21, 22, 23, 26, 27, 28 (Water Dept.	911.04
M. A. R. (Sale of Old tires)	5.04
	$37,734.08

EXPENDITURES.

Permanent Service	$25,338.01
Temporary Service	3,090.92
Motor Vehicle Supplies	1,438.86
Office Supplies	386.23
General Supplies	841.57
Instruments	96.60
Minor Apparatus	134.71
Tools	8.94
General Materials	143.75
Minor Repairs	32.20
Motor Vehicle Repairs	699.64
Postage	15.00
Storage of Vehicles	233.00

Street Car Fare	115.00
General Service	47.31
Auto Licenses	25.00
Motor Vehicle Equipment	500.00
Office Equipment	276.55
General Equipment	135.70
	$33,558.99
Balance	4,175.09
	$37,734.08

RECAPITULATION

RECEIPTS.

City Engineer, Budget Appropriation and Vouchers	$ 6,140.00
Engineering Division, Budget Appropriations and Vouchers	37,734.08
	$43,874.08

DISBURSEMENTS.

City Engineer	$ 6,081.36
Engineering Division	33,558.99
	$39,640.35
Balance	4,133.73
	$43,874.08

The past year has been an exceedingly busy year in the department, especially at the Intake System, in Track Elevation and Depression, Field and Office Work, and in concluding this report, I wish to express my appreciation to all the employees for their faithful and conscientious efforts in the accomplishment of their work, which is a great asset to the municipality.

Respectfully submitted,

GEO. F. STAAL,

Annual Report

of

Bureau of Power Plants
Flushing Stations

For the Year

1916.

THOMAS McMILLAN
Chief Engineer of Power Plants

Mr. Fred G. Simmons,

Commissioner of Public Works.

Dear Sir: The annual report of the Chief Engineer of Power Plants for the year ending December 31st, 1916 is herewith submitted.

MILWAUKEE REFUSE INCINERATOR.

Joseph E. Roddy .....Superitendent

The present equipment is the same as in previous years. All the furnaces were equipped with mechanical charging devices during 1916. An hydraulic ash car elevator was placed in the southeast corner of the Incinerator to elevate the ash cars from basement to grade level, with a slight slope to dump that the cars may be operated by two men, three being previously necessary to push the cars up the steep grade.

During the latter part of July owing to the extreme heat, sufficient steam was not generated to operate the Flushing Station, and the river came to such a condition, that power was bought from the Milwaukee Electric Railway & Light Co. This purchased power was continued until August 10th, when normal conditions were obtained, and the current again delivered from the Incinerator.

Total cost of Operation and Mixed Refuse Incinerated·

Year.	Total Tons Mixed Refuse Incinerated.	Total Cost Including Equipment.	Total Cost of Equipment.	Total Cost of Operation Only.	Cost per Ton.
1911	50,803.39	$57,419.47	$ 5,056.45	$53,363.02	$1.05
1912	48,413.32	56,760.51	3,580.74	53,179.77	1.10
1913	53,581.02	66,147.30	4,269.31	61,877.99	1.15
1914	54,684.15	67,892.43	1,365.48	66,526.95	1.22
1915	58,043.10	66,812.56	3,695.40	63,117.16	1.09
1916	54,275.36	67,613.10	3,374.64	64,238.46	1.1835

STATEMENT SHOWING TOTAL REFUSE INCINERATED, CITY AND PRIVATE COLLECTIONS DURING 1916 AND FEED WATER PUMPED TO BOILERS.

MONTH.	Total Hours Operated.	Total pounds mixed refuse incinerated.	Cubic feet of water to Boilers.	Temp. of water to boilers.	Average lbs. of water per hr. to boilers.	Average Evap. per lb. of mixed refuse.
January	608	8,689,780	80,396	180	8,010.50	1.784
February	692	8,136,140	74,518	180	7,625.50	1.802
March	648	8,688,100	69,607	180	6,507.39	2.060
April	656	7,537,720	83,255	180	7,688.39	1.494
May	680	9,335,800	99,588	180	8,872.11	1.547
June	656	9,553,680	83,515	180	7,712.40	1.887
July	640	9,640,020	89,833	180	8,503.25	1.771
August	680	10,766,800	94,860	180	8,450.91	1.873
September	656	10,160,360	87,160	180	8,049.66	1.924
October	664	9,748,820	82,341	180	7,512.37	1.954
November	656	7,770,000	72,418	180	6,687.62	1.771
December	648	8,523,500	80,797	180	7,553.42	1.741
Totals	7,784	108,550,720	998,295	180	7,768.06	1.794

Average percentage of Refuse incinerated during 1916.

Garbage—69.92%; Ashes—23.92%; Rubbish—5.85%; Manure—.31%.

Owing to the large percentage of moisture in garbage, better results would be obtained in generating steam from this material if a certain percentage would be pressed out by a suitable roller press; this will be experimented with at an early date.

REFUSE INCINERATOR POWER PLANT—1916.

Thomas Coughlin .....Engineer in Charge.

The Power Plant equipment is the same as noted in previous years. The power delivered in 1916 from the Incinerator Power Plant to operate the Milwaukee River Flushing Station, was as follows:

rsonal Se
rsonal S
tanical S
aning ar
el .....
dical and
ice Suppl
neral Sup
nor Appa
ols .....
neral Ma
neral Rep
nor Repa
ower .....
am Hire
ephone ..
ter .....
neral Serv
vertising
urance ..
usehold I
ice Equip
neral Equ

Total Ex
c. Acct. I
c. Acct. I
sn. File 11
dget Appr

Total Re

*Power

ANNUAL FINANCIAL REPORT OF THE BUREAU POWER PLANTS FOR THE YEAR 1916.

	Incinerator.	Incinerator Power Plant.	Milwaukee River Station.	Jones Island Station.	Kinnickinnic River Station.	McKinley Park.	Milwaukee River Dam.	TOTALS.
Personal Service (permanent)	$59,017.03	$3,780.00	$ 8,019.96	$14,605.86	$11,727.12	$ 973.45	.....	$198,123.42
Personal Service (temporary)	228.00	.....	.....	.....	.....	.....	$135.50	363.50
Botanical Supplies	.....	.....	.....	.....	.....	.....	.....	.....
Cleaning and Disinfecting Supplies	4.47	.....	28.41	37.58	6.94	.....	.....	77.40
Fuel	999.03	.....	87.50	8,911.90	2,797.24	.....	.....	12,795.67
Medical and Laboratory Supplies	.....	.....	.....	.....	.....	.....	.....	.....
Office Supplies	25.16	5.90	4.60	3.60	1.81	.....	.....	41.07
General Supplies	445.28	78.08	143.78	723.34	290.92	5.37	.....	1,686.77
Minor Apparatus	10.46	.....	48.54	20.60	5.22	10.00	.....	94.82
Tools	57.35	.....	.41	4.33	3.43	.....	.....	65.52
General Materials	565.25	27.39	71.79	119.40	67.40	48.00	48.00	947.23
General Repairs	527.53	60.70	23.90	2,357.64	184.35	14.64	.....	3,168.76
Minor Repairs	115.99	.....	.....	.....	.....	.....	.....	115.99
*Power	.....	.....	3,186.91	.....	.....	.....	.....	3,186.91
Team Hire	200.58	.....	.....	.....	.....	382.62	.....	583.20
Telephone	10.20	.....	51.64	72.00	98.72	.....	.....	232.56
Water	1,919.68	.....	.....	398.94	148.08	291.15	.....	2,757.85
General Service	8.49	.....	.....	47.99	73.37	.....	.....	129.85
Advertising	.....	.....	.....	.....	.....	.....	.....	.....
Insurance	103.96	.....	.....	103.96	51.98	.....	.....	259.90
Household Equipment	.....	.....	.....	.....	.....	.....	.....	.....
Office Equipment	.....	.....	.....	.....	.....	.....	.....	.....
General Equipment	3,374.64	.....	.....	.....	2.00	.....	.....	3,376.64
Total Expenses—1916	$67,613.10	$3,952.07	$11,667.44	$27,407.14	$15,458.58	$1,725.23	$183.50	$128,007.06
Misc. Acct. Rec. U. S. Govt. (current	.....	.....	.....	25.00	.....	.....	.....	25.00
Misc. Acct. Rec. Scrap gates sold	.....	.....	.....	.....	23.03	.....	.....	23.03
Resn. File 11462 and 11464a for power	.....	.....	6,000.00	.....	.....	.....	.....	6,000.00
Budget Appropriation	75,643.00	4,425.00	18,985.00	25,284.00	19,061.00	2,395.00	250.00	146,043.00
Total Receipts—1916	$75,643.00	$4,425.00	$24,985.00	$25,309.00	$19,084.03	$2,395.00	$250.00	$152,091.03

*Power purchased from T. M. E. R. & L. Co.

MONTH.	Total hours operating flushing Sta.	Average K. W. operating flushing Sta.	Total K. W. H. delivered to flushing Sta.	
January	109.20	350	38,265.5	
February	26.45	340	9,095.0	
March	10.20	380	3,925.4	
April	183.50	357	65,627.3	
May	297.40	340	101,204.4	(From July 28th to
June	151.15	340	51,425.0	September 13th, 48
July	327.40	323	105,834.1	days, power was pur-
August	(none)	(none)	(none)	chased to operate
September	240.40	320	77,011.2	flushing station—316,-
October	365.30	320	116,960.0	688 K. W. Hrs.)
November	179.00	320	57,280.0	
December	178.35	320	57,146.0	
Totals	2,070.35	328	683,773.9	

The operation of the machinery at the Power Plant was satisfactory during the year, only minor repairs being necessary.

MILWAUKEE RIVER FLUSHING STATION—1916.

David E. Cameron .....Eingineer in Charge.

The equipment at this station is the same as noted in previous years.

Total hours in operation, flushing, 1916	3,019.55
Average K. W. delivered	310
Total K. W. H. delivered	936,141
Total cubic feet of water displaced	7,662,425,080
Total gallons of water displaced	57,318,916,397
Average head of water, in feet	3.16

This includes the power furnished during summer months. During the year 1916 the operation of the machinery was satisfactory, no extensive repairs being necessary. Provision has been made to place a fan in the machinery pit, for keeping the motor at normal temperature; this will be placed in the early part of 1917.

JONES ISLAND FLUSHING STATION—1916.

Joseph P. Rafenstein .....Engineer in Charge.

The equipment at this station is the same as reported in previous years.

Total hours in operation, 1916 ..... 6,220.40
Total coal consumed 4,688,240

Only raw sewerage was pumped during the year, and was operated as far as possible, to obtain the best results in connection with the Sewerage Commission Testing Station. Considerable trouble was experienced during September and October in operating the machine, owing to the condition of the foundation which rests on strata or layer of loose material. This trouble was overcome during November by placing a self-aligning thrust bearing to support the main shaft and pump and since that time has operated satisfactorily. This machine has been in operation for a period of thirty-two years. It is desirable to keep in operation until the Sewerage Commission construct the new disposal plant, after all necessary experiments have been made.

KINNICKINNIC RIVER FLUSHING STATION—1916.

Ernst C. Eggebrecht .....Engineer in Charge.

The present equipment at this station is the same as noted in 1915.

Total hours in operation, 1916 .....7,595.25
Total cubic feet of water displaced, 1916 11,830,898,000
Total gallons of water displaced, 1916 88,501,257,276
Total coal consumed in pounds, 1916 2,695,750
Average head of water in feet, 1916 2,382

No extensive repairs were necessary on the machinery and boilers during the year and all is now in good operating condition. The pumps were operated at such speed as to keep the Kinnickinnic river in good condition, and no complaints were made during the year.

New superheaters for the boilers should be placed at an early date, as the present ones require renewal. The operation was satisfactory during the year and with the replacement recommended will place the station as a whole in good operating condition.

Respectively submitted,

THOMAS McMILLAN,
Chief Engineer Power Plants.

Report of
Bureau of Illumination Service

For the Year
1916

Milwaukee, Wis., March 29th, 1917.

Mr. F. G. Simmons,

Commissioner of Public Works·

Dear Sir: We are handing you herewith, report of the Bureau of Illumination Service for the year ending December 31st, 1916.

Inasmuch as this Bureau was created by act of the Common Council, in June of this year, and that the actual installing of the street lighting units has not as yet begun, we appreciate the fact that to the layman the work accomplished during the first months of the Bureau's existence looks small, but when we consider the organizing of the Bureau and the settling of the great number of engineering problems and with the obstacles that have arisen from various sources, which, if are given the proper consideration, will perhaps alter materially this impression. This is not being offered as an apology, but simply mentioning some things, that are perhaps, overlooked during the infancy of an organization. This report will therefore cover the organizing of the Bureau, the engineering done and the contracts awarded, together with the ordering of the majority of the instruments for the Electrical Testing Laboratory. During this time the matters of detail, design of Posts, Brackets, Harps, Fixtures and Substations were disposed of, together with making of the necessary lay out maps and the actual locating of, on the streets of approximately 300 gas units and approximately 200 electric units preparatory to the spring installation of same and the installing of a maintenance record system of the lamps and refractors whereby the life and cause of failure of each is accurately kept.

There has also been established at 510-512 Edison avenue, a storeroom and repair shop where the smaller materials are received and stored. The repair shop is equipped with the necessary tools to take care of the repairs incident to the operation.

The following Wire and Cable Contracts were awarded:

Contractor.	Amount of Contract.	No. of Feet Received Dec. 13, 1916.
Julius Andrae & Sons Co.	600,000 ft.	22,435 ft.
American Steel & Wire Co.	453,000 ft.	88,010 ft.
Boggis-Dietz Elec. Co.	100,000 ft.	92,405 ft.
Hazard Mfg. Company	70,000 ft.	60,536 ft.

This cable is being received and stored in the yard of the City Water Department at 33rd and Vliet Streets.

Other Contracts were awarded to the following:

Universal Concrete Products Company, for, Concrete Post Shafts and Brackets, amounting to	$114,075.0(
Kuhlman Electric Co., Transformers, amounting to	35,306.7
Central Foundry Co., Harps and Fittings, amounting to	9,355.0(
Julius Andrae & Sons Co., machine work on Harps, amounting to	3,425.0(
Line Material Company, Fixtures, amounting to	44,907.0(
Line Material Company, Refracting Glassware, amounting to	22,860.0(
Commercial Truck Company of America, 1 Extensible Platform Truck, amounting to	3,430.0(

STATEMENT OF REVENUES, EXPENDITURES AND RESERVES.

Year Ending—December 31st, 1916.

REVENUES.

Amount available from sale of bonds		$750,000.00	
Amount reserved from 1916 Street Lighting Fund by the Common Council for salaries and purchase of materials and supplies—**Reso. File No. 9790,** adopted June 28th	$ 9,500.00		
Less amount unexpended — being credited back to Street Lighting Fund	2,150.50		
		$ 7,349.50	
Amounts available from other sources —Jan. 1, 1916, Balance—Contracts	9,971.53		
Other than Contracts	7,752.45	17,723.98	
Miscellaneous Credits		131.05	
TOTAL REVENUES			$775,204.5

EXPENDITURES AND RESERVES.

Total amount of all Contracts awarded since creation of Bureau	$455,238.04	
Payments made thereon	65,248.27*	
		$ 65,248.27

RESERVE FOR CONTRACTS—as of Jan. 1, 1917		389,989.77
Payments on contracts entered into prior to creation of Bureau		9,971.53*
Salaries, materials and supplies under authority File No. 9790	7,349.50*	
Salaries, materials and supplies—from Construction fund	21,343.08*	
		$ 28,692.58

RESERVES.

For 1916 Encumbrances	$ 4,488.21	
Unexpended Balance, Improvements in Progress	276,814.17	
		$281,302.38
TOTAL RESERVES AND EXPENDITURES		$775,204.53

*Expense	$103,912.38
Reserves	671,292.15

The personnel of the Bureau are:

Wm. W. Rumsey, Engineer Const. and Maintenance; Howard F. Ilgner, Illuminating Engineer, and F. A. Vaughn, as Consulting Engineer, under whose direction the specifications were drawn and contracts let.

Respectfully submitted,

WM. W. RUMSEY,
Engineer Const. and Maintenance.

HOWARD F. ILGNER,
Illuminating Engineer.

Report of
Water Works

For the Year Ending
1916

MILWAUKEE WATER WORKS.

Commissioner of Public Works
FRED G. SIMMONS.

Deputy Commissioner of Public Works
PERCY BRAMAN.

City Engineer
GEO. F. STAAL.

Superintendent of Water Works
HENRY P. BOHMANN.

Thos. McMillan ..... Chief Engineer of Power Plants.
Ferd. Krieger ..... Assistant Chief Engineer of Power Plants.
William Kunz ..... Engineer in charge of North Point Pumping Station.
William Bormann .... Engineer in charge of High Service Pumping Station.
John Koch ..... Superintendent of Distribution.
Ferd. E. Fitz ..... Assistant Superintendent of Distribution.
Frank J. Murphy.... Superintendent of Meters.
Oswald J. Ronge .... Chief of Collection Division.
W. E. Schneider..... Chief Accountant (General Office).
George Eigner ..... Keeper of Pipe Yard.
A. E. Kienth ..... Water Chemist.

Committee on Water Works
ALD. GEORGE T. GREDE, Chairman.
ALD. STORMY S. THOMPSON
ALD. JOHN DOERFLER, JR.
ALD. JOHN W. RADKE
ALD. AUG. W. STREHLOW

REPORT OF SUPERINTENDENT.

OFFICE OF SUPERINTENDENT OF WATER WORKS.

CITY HALL.

Milwaukee, January 25th, 1917.

Hon. F. G. Simmons,

Commissioner of Public Works.

Dear Sir: I take pleasure in submitting herewith the report of the operations of the Water Works for the year ending December 31st, 1916.

The following is a statement of the revenues and expenditures of the department for the year 1916:

FINANCES, 1916.

INCOME, ACCOUNTS.

OPERATING REVENUES.

Earnings from commercial sales	$327,703.01	
Earnings from industrial sales	465,102.19	
Earnings from municipal hydrant rentals	18,405.00	
Earnings from sales for street sprinkling	19,793.72	
Earnings from sales to municipal departments	74,563.70	
Earnings from other civic divisions	63,429.51	
Miscellaneous earnings from operation	1,778.73	
Total Operating Revenues		$970,775.8

GENERAL OPERATING EXPENDITURES.

General Office Expense	$ 15,556.33	
Miscellaneous General Expense	2,532.06	
Commercial Expense	57,979.36	
General Stores Expense	3,824.60	
Total General Operating Expenditures		$ 79,892.35

DIRECT OPERATING EXPENDITURES.

ater Collection Properties			
ırification	$ 6,710.90		
ımping (N. Pt. Pumping Sta.)	113,732.69		
ımping (Riverside Pumping St.)	40.84		
epumping (N. Av. and 10th St. Sta.)	15,059.06		
ansmission Mains, Reservoir and Standpipes	3,654.17		
stribution Division	50,794.64		
eter Division	27,142.05		
Total Direct Operating Expenditures		$217,134.35	
nancial Expenditures		7,212.39	
Total Expenditures		$304,239.09	
epreciation		$ 96,296.00	$400,535.09
Net Operating Revenue			$570,240.77
uasi Operating Revenue		$ 55,387.24	
uasi Operating Expenditures		40,499.71	
Net Quasi Operating Revenue			$ 14,887.53
on-Operating Revenue			19,328.50
nancial Revenue			75.00
Gross Income			$604,531.80
eduction from Gross Income—Interest on Funded Debt			11,600.00
Net Income			$592,931.80

DISPOSITION OF NET INCOME.

opropriation to Municipal Funds	$200,000.00	
il. credited to City Proprietary Interest	392,931.80	
Total		$592,931.80
oprietary Interest at beginning of year	$8,826,640.84	
crease for the year as above	392,931.80	
djustment of stock at end of year (Profit and Loss Account)	769.04	
ncellation of old city orders	19.35	
Reconcilliation of Physical Inventory of Fixed Assets, Dec. 31, 1916, with book value	309,573.52	
		$9,529,934.55

Decrease from cancellation of revenue of prior fiscal periods	$ 174.24		
Uncollectible Accounts cancelled by Common Council	155.63	329.87	
Total Proprietary Interest at close of year			$9,529,604.68

*Physical Inventory of stock $769.04 in excess of book value due to accumulation of scrap.

**Adjustment approved by the Railroad Commission of Wisconsin.

BALANCE SHEET.

Assets.

Fixed Assets—			
Property and Plant—			
Value beginning of year		$8,620,563.42	
Construction and Equipment current fiscal year		416,548.00	
Increase of Fixed Assets due to Appraisal		309,573.52	
			$9,346,684.94
Less Depreciation written off	$419,446.69		
Exchanged during year	81.00	419,527.69	
Value close of year			$8,927,157.25
Sinking Fund—			
Cash transferred to City Sinking Fund to pay Water Bonds maturing in 1917			15,000.00
Floating and Nominal Assets—			
Net Cash (in hands of City Treasurer)			523,583.32
Revenue Accounts Receivable—			
Water, 1916	$285,225.78		
Miscellaneous, 1916	2,906.09		
Miscellaneous, previous to 1916	253.73		288,385.60
Materials and Supplies			91,291.83
Chargeable work in Progress			110.00
Prepaid Accounts—			
Boiler Insurance	341.82		
Interest on Bond Maturing in 1917	5,400.00		5,741.82
Total Assets			$9,851,269.82

LIABILITIES.

Capital Liabilities—		
Bonded Debt		$ 255,000.00
Revenues Levied in Advance—		
Prepaid Lock, Box Test and Set Bills		270.37
Customers' Deposits—		
Hydrant Wrenches	$ 327.00	
Customer's Meter Deposits	650.00	977.00
Sundry Accounts Payable (Unpaid Vouchers	$46,114.65	
Accrued Accounts (Pay Rolls)	375.00	46,489.65
Contract Liabilities Deferred		18,737.58
Duplicate Payments on Water Bills uncalled for		190.56
City Unreserved Proprietary Interest		9,529,604.68
Total Liabilities		$9,851,269.84

FINANCIAL.

The financial results of the operation of the Water Works for the past year have been most gratifying. The disturbing influences due to the depression in the industrial field during 1914 and 1915 which greatly reduced the revenues of the water department, have been offset by a year of great activity, as a result of which the past year has proven to be the largest revenue producing year in the history of the Water Works.

The total revenues for water were $970,775.86, being an increase of $133,541.86 over the preceding year; the increase from industrial consumers alone amounting to $89,868.94, and from adjoining villages and County Institutions $16,641.84.

The total revenues of the department from all sources were $1,045,566.60.

The net revenues of the department over and above operation, maintenance, depreciation and interest on bonded indebtedness were $592,931.80 of which sum $200,000.00 was transferred to the General City Fund towards reducing the general tax and the remainder $392,931.80 was used for new construction work and equipment.

The surplus earnings of the Water Works transferred to the General City Fund since 1892 now aggregate the sum of $2,517,-65.00 exceeding the amounts raised by tax levy, during the earlier years of the Water Works by $640,426.28.

The value of the Water Works less depreciation is $8,927,157.25 and the bonded indebtedness less Sinking Fund on hand only $240,-

000.00. No bonds were issued during the past year. All new construction work was paid out of the earnings of the department.

With the approval of the Railroad Commission of Wisconsin, an entry was made on the books of the Water Works as of December 31st, 1916, increasing the value of the property and plant in the sum of $309,573.52, so that the book value and the present physical valuation of $8,927,157.25 made December 31st, 1916, are now identical.

Prior to making this entry the physical inventory taken each year was always greatly in excess of the book value. The book value included a number of items no longer in existence, but were more than offset by the increase in the real estate owned by the Water Works which was carried on the books at the original cost paid more than forty years ago. A physical valuation made by the Railroad Commission as of June 30th, 1911, if brought to date would show practically the same valuation.

OPERATION AND MAINTENANCE.

The cost of operation and maintenance for 1916, excluding depreciation was $304,239.09 or $15.14 per million gallons pumped. This is a reduction of $1.22 per million gallons as compared with the previous year.

CONSTRUCTION.

The total amount expended for construction work and new equipment was $416,548.00.

WATER RATES.

Since May 1st, 1913, all services are metered, with the exception of such supplying Automatic Fire Sprinkling Systems, Fire Hydrants, Fire Cisterns, Horse Drinking Troughs and Bubblers.

The metered rate which remains unchanged is 4 1-2 cents per 100 cubic feet or 6 cents per 1,000 gallons for water supplied within the city; and 6 cents per 100 cubic feet or 8 cents per 1,000 per 1,000 gallons for water supplied for consumption beyond the city limits. There is no "minimum charge"; nor "service charge", the consumer paying only for actual consumption. The meter must be furnished by the consumer.

The charge for hydrant rental is $5.00 per hydrant, per year. Drinking Troughs and Bubblers, each $50.00 per year.

Water is furnished outside of the city to the Villages of East Milwaukee, West Milwaukee, North Milwaukee, Whitefish Bay, the city of West Allis, County Institutions in the Town of Wauwatosa and to a number of individual consumers in the Towns of Lake, Milwaukee, Greenfield and Wauwatosa.

WATER SUPPLY.

The source of Milwaukee's entire water supply is Lake Michigan. The present Intake which is known as the North Point Intake is 8,146 feet in length and consists of a brick tunnel 7 1-2 feet internal diameter and 3,146 feet in length, extending from the Shore Shaft to a Lake Shaft in a crib. From the latter two parellel lines of 60 inch cast iron water pipe laid in a trench at the bottom of the lake extend 5,000 feet farther out into the lake into 60 feet depth of water. The upturned pipes at the outer ends are held in place by submerged cribs. From the Shore Shaft a Shore Tunnel 7 1-2 feet in diameter extends to and in front of the pumping station with branches leading to the several pump wells.

The distance of the Intake from the mouth of the harbor is 3 1-2 miles. The capacity of the Intake with a drop of 4 feet in the pump wells is 75,000,000 gallons in twenty-four hours, and with a drop of 8 feet in the pump wells 95,000,000 gallons. The latter figure represents the maximum capacity of this Intake.

There is now in course of construction a new Intake to be known as the Linwood avenue Intake. This Intake will consist of a concrete lined tunnel of 12 feet internal diameter and 6,500 feet in length. The first section of this project consisting of 4,000 lineal feet of lake tunnel and shore shaft was completed by the contractor Joseph Hanreddy under contract awarded to him on April 29th, 1913.

The contract for the second section consisting of 2,500 lineal feet of lake tunnel and submerged intake crib was awarded to the O'Brien and Jackson Construction Co., on March 20th, 1916, to be completed on September 1st, 1917. The contractors have completed approximately 800 lineal feet of the tunnel up to December 31st, 1916.

On October 3rd, 1916, the O'Brien and Jackson Construction Co., completed the construction of the shore tunnel of the new Linwood Avenue Intake for which a contract had been awarded to said firm on April 27th, 1915. This contract consisted of 5,644 lineal feet of concrete lined tunnel, 9 feet internal diameter and con-

nects the new Linwood Avenue Intake with the North Point Pumping Station, which is a little over a mile south of the shore shaft of the Linwood Avenue Intake Tunnel.

The capacity of the new tunnel will be approximately 220,000,000 gallons in twenty-four hours, at a velocity of three feet per second.

The original intake consisting of a thirty-six inch cast iron water pipe and extending only 2,100 feet out into the lake in 18 feet depth of water was permanently placed out of service at the time of the completion of the North Point Intake on September 25th, 1895.

WATER PURIFICATION.

The quality of our lake water during the year 1916, was not as good as during the previous year. Laboratory tests made showed an unusual large increase in the number of bacteria in the raw water.

The average number of bacteria in 1 c.c. of raw water developing on gelatine plates incubated 48 hours at 20 degrees C. was 4,530, being an increase of over 85 per cent over the preceding year. On 19 days the number of bacteria in 1 c.c. of raw water was in excess of 10,000, the maximum being 19,660. During the preceding year there were only three days on which the number of bacteria exceeded 10,000 with a maximum of 14,360.

The average number of bacteria in the treated water developing on gelatine plates, incubated 48 hours at 20 degrees C. was 65, and on standard agar plates, incubated 48 hours at 37 degrees C. 21.

"Presumtive tests" indicated the presence of B. Coli in 98.2 per cent of all the 10 c.c. samples of raw water examined, and in 88 per cent of all the 1 c.c. samples of raw water examined in 1916.

In 1913 the percentage of B. Coli in 10 c.c. samples of raw water examined was 89.3 per cent, in 1914 90.7 per cent, and in 1915 95.1 per cent, clearly indicating a rapid increase of sewage pollution of our lake and the danger of taking a water supply from a sewage polluted source.

In the treated water B. Coli was present in 21.9 per cent of all 10 c.c. samples examined.

The results obtained insofar as they effect the typhoid death rate were not as gratifying as the preceding year. Early in January an epidemic of grippe preceded an outbreak of intestinal troubles, which shortly after developed many cases of typhoid

and for a time threatened to become epidemic. Prompt and energetic steps taken by the Health Commissioner brought the situation under control in a comparatively brief time, thereby averting a serious epidemic.

While the typhoid death rate of 14.9 per 100,000 of population is considerable higher than the three preceding years, if we exclude these years there are only two years, viz: 1897 and 1904 when the typhoid death rate was lower than last year, covering a period of over 40 years.

The amount of Liquid Chlorine applied varied from 32 to 50 ounces per million gallons of water or from 0.24 to 0.38 parts available chlorine per million parts of water.

PUMPING DIVISION.

The total amount of water pumped from the lake at North Point Pumping Station during the year 1916, was 20,088,044,030 gallons computed from the actual plunger displacement of the pumps with no allowance for slippage. This is an average daily consumption of 54,885,366 gallons, and an average daily increase of 7,441,052 gallons over the preceding year. It is the highest pumpage in the history of the Water Works. The maximum pumpage in any one day was on July 28th, viz: 79,525,670 gallons and the minimum pumpage in any one day, January 1st, viz, 36,100,180 gallons.

The average daily consumption for the past five years has been as follows:

Year.	Gallons
1912	47,556,310
1913	47,926,734
1914	48,509,573
1915	47,444,314
1916	54,885,366

The amount of water repumped at the High Service Pumping Station was 1,523,832,400 gallons. In addition thereto three 12,000,000 gallon pumping engines located at North Point Pumping Station delivered 7,395,531,250 gallons direct into the high level district. The amount of water delivered in the high level district was 44 per cent of the total pumpage.

Of the total amount of water pumpped 2,265,811,700 gallons or 11.27 per cent was furnished to consumers outside of the city. The revenues received for water furnished outside of the city was $182,543.98 or 18.7 per cent of the total revenue received for water.

The average head pumped against in the low service was 163.4 feet, high service 273.9 feet. Average head of high and low service 204.09, which is an increase of 10.574 feet over the preceding year.

Owing to the increased demands for water for industrial purposes the average daily consumption per capita which in 1915 was 105.4 gallons, was increased to 118 gallons for the year 1916.

The average duty of all the engines at North Point Pumping Station was 111,763,087 foot pounds per 100 pounds of coal, and for the High Service Pumping Station 85,178,320 foot pounds, being an increase of 1,492,812 and 4,716,330 foot pounds respectively.

The total amount of coal consumed at the North Point Pumping Station was 15,341 tons and at the High Service Station 102 tons.

The grade of coal used was 2-3 Pocahontas and 1-3 Youghiogheny Screenings. Somewhat better operating results have been accomplished with this mixture although for a time there were numerous complaints from the immediate residents of the North Point Pumping Station on account of cinders and soot emitted from the stacks. The Chief Engineer of Power Plants recommends that the next contract be let in the proportion of 2-3 Youghiogheny Screenings and 1-3 Pocahontas Screenings as he finds this mixture better suited to our conditions.

On account of the delay of the Central Purchasing Committee in getting out the new specifications for coal covering the requirements of all city departments, the water department was compelled to purchase coal on open order without a guaranty of analysis or test for a period of nearly a month after the completion of the regular annual contract. An analysis made of the deliveries showed the coal to be of very poor quality, and emphasizes the fact that the purchase of coal on the B. T. U. basis is the best guarantee of securing the quality of coal contracted for.

With the completion of the installation of 2 30-inch Venturi Meters in the discharge mains of Nos.3 and 4 pumping engines, the entire pumpage of the North Point Pumping Station was placed under meter control, which will afford a good check on the performance of the pumps.

The recommendations of the Chief Engineer of Power Plants of 2 300 H. P. Water Tube Boilers to replace 2 horizontal tubular boilers in the south boiler house, 1 15 Million High Service Triple Expansion Pumping Engine, one 20 ton coal truck weighing scale for the North Point Pumping Station are absolute necessities due to

the extraordinary increase in our pumpage during the past year and which promises to continue during the coming year. A safe operating margin must be maintained at all times in order to meet any and all demands.

The High Service Pumping Station located on North Avenue between 10th and 11th Streets was operated in the day hours only, viz: 5 A. M. to 9 P. M.

An extension of 23 feet made to the standpipe at this station in 1914, was carried through the roof of the tower enclosing the standpipe without extending the tower proper, leaving the standpipe open to the atmosphere. An extension should be made to the tower so as to again inclose the standpipe. This will prevent foreign substances from falling into the water as well as lessen the possibilities of heavy ice formation.

All of the equipment of both stations have been kept up to the usual high efficiency. No important repairs were found necessary during the past year.

DISTRIBUTION DIVISION.

The past year has not been productive of the same relative increase in the extension of the distribution system as has been characteristic for the past number of years, due to the fact, that nearly all platted property within the city's limits is now supplied with city water, and unless large tracts of land adjoining the city are annexed, but small mileage of distribution mains will be extended in the future.

A total of 5.170 miles of water mains were laid, giving us a total of 536.032 miles at the close of the year. 43 Fire Hydrants and 85 Gate Valves were added to the distribution system, giving us at the close of the year 3,681 Fire Hydrants and 4,286 Gate Valves.

All new water mains are laid under contract, the department furnishing the pipe, specials, gates and hydrants. Plans for the laying of the water pipe are prepared by the City Engineer who also gives the necessary lines and grades.

A total of 2,597 tap and branch connections were made to our system during the past year, of which number 1,767 were improvement taps, and extended to curb only. This gives a total of 83,408 tap and branches to date. Of this number 63,914 are active taps and 19,494 extended to curb only or turned off at either curb or at the main and not in use.

Beginning January 1st, 1916, all curb stops were furnished to the plumber by the Water Department and the tapping fees in-

creased $1.00 to pay for the stop. These stops are purchased under definite city specifications and before acceptance by the city are tested for tightness, metal mixture and weight. This assures us a stop of uniform high grade and eliminates the use of cheap brass goods as supplied in the past by many plumbers.

This arrangement has proven so satisfactory to all concerned that the department has under consideration the furnishing of the meter stop and couplings which are now furnished by the plumber.

In addition to lowering the water mains in a number of streets where the mains had been laid, previous to the establishment of the grade, the department lowered a 16 inch water main in Lake Street between Reed Street and Clinton Street, also lowered and moved a 20 inch main in Reed Street between Florida Street and Lake Street, both on account of track depression.

During the past year there were 26 breaks in water mains of which 8 were due to electrolysis.

On January 2nd, 1916, the Department lost by death Mr. Wm. McCaigue, Superintendent of Distribution. His connection with the department began in 1872.

Mr. John Koch, Assistant Superintendent of Distribution was promoted to the position made vacant by the death of Mr. McCaigue. Mr. Ferd. E. Fitz employed in the department during the past 30 years was appointed to the position of Assistant Superintendent of Distribution.

KILBOURN PARK RESERVOIR.

The reservoir which is located in Kilbourn Park no longer serves as a storage reservoir as it did in the early years after its construction. The purpose it now serves is to equalize the pressure in the low service district and as the source of supply for the High Service Pumping Station on North Avenue between 10th and 11th Streets.

The reservoir is of irregular shape and was built to conform to the grounds on which it is located. Its average length is 515 feet, average width 310 feet. When the depth of water in the reservoir is 21.5 feet the elevation of water above datum is 150 feet. At this level the capacity of the reservoir is 21,000,000 gallons or about one third of a day's supply.

The park connected with the reservoir was kept in the usual attractive condition. As in previous years, band concerts were given during the months of July and August at an expense of $500.00, which was paid out of the Water Fund.

The following table indicates the depth of water maintained in the reservoir each month of the past year.

MONTH	Highest.	Lowest.	Mean.
January	21.30	18.20	20.37
February	21.30	18.60	20.56
March	21.30	17.70	20.49
April	21.30	17.70	20.35
May	21.30	17.50	20.75
June	21.30	17.70	20.23
July	21.30	15.10	20.15
August	21.90	18.20	20.84
September	21.90	18.20	20.26
October	21.70	17.40	20.32
November	21.70	18.20	20.57
December	21.70	18.30	20.44

Highest during year ..... 21.90 feet
Lowest during year ..... 15.10 feet
Average mean ..... 20.44 feet

METER DIVISION.

During the past year, 1,815 new meters were added to the service and 726 placed out of service on account of replacements with new meters or taken off on account of removal of buildings, etc., leaving 63,277 meters in actual service December 31st, 1916.

A total of 12,822 or 20 1-4 per cent of those in service required repairs during the year of which number 8,483 or 66 per cent were repaired in the shop and 4,339 or 34 per cent repaired on the premises.

Through the consolidation of the position of Chief Water Waste Inspector and that of the Superintendent of Meters there has been a saving of $1,200.00 per annum. A further saving of $720.00 was effected in this division by rearranging the clerical work so that it was possible to eliminate one clerkship.

This division now has charge of the sealing and inspection of all automatic sprinkler equipments, which in the absence of meters are controlled in this manner. As this entails an expense to the department from a class of service from which the department receives no revenue, an effort will be made to have a bill passed at the next session of the Legislature authorizing the Commissioner of Public Works to prescribe and regulate the size of connections made with the distribution mains of the Water Works for supplying automatic sprinkler systems and fixing an annual charge for such service.

There were 16 premises equipped with automatic sprinklers during 1916, making a total of 189 premises equipped December 31st, 1916.

COLLECTION DIVISION.

On December 20th, 1916, the Common Council under authority of an Act of the last Legislature, known as Chapter 110 Laws of 1915, passed an Ordinance creating the above division in the Water Works, abolished the offices of Water Registrar and Deputy Water Registrar, and placed the assessment and collection of water rates in the hands of the Superintendent of Water Works to take effect January 1st, 1916.

Under the new organization Mr. Oswald J. Ronge, former Chief Clerk under the Water Registrar was made Chief of the new division, and under the direction of the Superintendent of Water Works has direct charge of this division of the Water Works. The work of this division under the new arrangement was performed in an efficient and capable manner.

In order to safeguard the interests of the Water Department it was deemed advisable to place all employes of this division who handle cash under a bond, as the City Attorney rendered an opinion that the head of the department was not liable on his bond for the action of his subordinates. The chief of the division and the five collection clerks are now required and have furnished a bond of $5,000.00 each thereby affording the city ample protection at an annual expense of only $75.00 in premiums. As the business transacted by this division is approximately one million dollars, the necessity of bonding the employes handling cash becomes very apparent.

CONCLUSION.

In conclusion I take this opportunity to thank you for your co-operation in all matters pertaining to this department and also to express my appreciation to the heads of the several divisions of the Water Works and to the employes under them for the faithful and efficient performance of their respective duties during the past year.

The usual statistical matter relating to the Water Works are presented in the following pages.

Respectfully submitted,

H. P. BOHMANN,
Supt. of Water Works.

SUMMARY OF STATISTICS FOR THE YEAR ENDING DECEMBER 31st, 1916.

In form recommended by the New England Water Works Association.

MILWAUKEE WATER WORKS.

Milwaukee, Milwaukee County, Wisconsin.

GENERAL STATISTICS.

Population by census of 1910, 373,857. Present population estimated at 40,000.

Date of original construction, 1872-1874.

By whom owned, City of Milwaukee.

Mode of supply (whether gravity or pumping), pumping.

PUMPING STATISTICS.

1. Builders of pumping machinery, Edward P. Allis Co., Allis-Chalmers Co., Wisconsin Engine Co.
2. Description of fuel used:
   - A. Kind, bituminous.
   - B. Brand of coal, Pocahontas Screenings and West Virginia Splint to June 1st, 1916, and Pocahontas Screenings and Youghiogheny Screenings after June 1st, 1916.
   - C. Price of coal per ton of 2,000 lbs., delivered by team to Pumping Stations.

     West Virginia Splint and Youghiogheny Screening to June 1, $2.97 1-2. Pocahontas Screenings $3.35. Youghiogheny Screenings $3.10 after June 1st.
   - D. Percentage of ash of coal consumed at North Point Pumping Station, 14.49.
   - E. Percentage of ash of coal consumed at High Service Pumping Station, 11.41.
   - F. Wood, price per cord, none used.
3. Coal consumed:
   - A. North Point Pumping Station (for all purposes).....30,687,100 lbs.
   - B. North Point Pumping Station (while pumping) .....30,593,500 lbs.
   - C. High Service Pumping Station (for all purposes) ..... 2,054,200 lbs.
   - D. High Service Pumping Station (while pumping) ..... 1,690,800 lbs.
4. Pounds of wood consumed ; 3 — equivalent amount of coal, none.
   - A. Amount of other fuel used, none.
5. Total equivalent coal consumed for the year (4) lbs., none.
6. A. Total pumpage for the year at North Point Pumping Station where all direct pumpage from the lake is done, 20,088,044,-030 gallons.
   - B. Total pumpage for the year at High Service Pumping Station where the water is repumped from the reservoir into the High Service district, 1,523,832,400 gallons.

7. Average static head against which pumps work (North Point Pumping Station low service), 150 feet.
8. A. Average dynamic head against which pumps work (North Point Pumping Station), low service 163.403, high service 273.922. Average of high and low service 204.091 feet.
   B. Average dynamic head against which pumps work (High Service Pumping Station), 113.32 feet -|- suction head 10.35 feet -|- 128.30 feet = 251.97 feet above datum.
9. A. Number of gallons pumped per pound of equivalent coal (5), none. Gals. pumped (6.A) X 8.34 (lbs.) X 100 X dynamic head (8.A).
10. Duty = ——————————— = 111,763,087 lbs.
    Total fuel consumed while pumping at North Point Pumping Station (3.B).
11. Cost of pumping, figured on pumping station expenses, viz., North Point Pumping Station, $113,732.69; High Service Pumping Station, $15,059.06.
    (a) Per million gallons pumped at North Point Pumping Station, $5.66.
    (b) Per million gallons repumped at High Service Pumping Station, $9.88-|-$5.66=$15.54.
12. A. Per million gallons raised one foot (dynamic) at North Point Pumping Station, $0.02774.
    B. Per million gallons raised one foot (dynamic) at High Service Pumping Station, $0.07989.

STATISTICS OF CONSUMPTION OF WATER.

1. Estimated total population at date (city only) 440,000
2. Estimated population on lines of pipe (city only) 440,000
3. Estimated population supplied (includes suburbs) 465,000
4. Total consumption for the year ..... 20,088,044,030 gals.
5. Passed through meters ..... 14,384,972,400 gals.
6. Percentage of consumption metered 71.6
7. Average daily consumption ..... 54,885,366 gals.
8. Gallons per day to each inhabitant (1), after deducting water furnished outside of city ..... 110.7 gals.
9. Gallons per day to each inhabitant, including population supplied outside of city (3) ..... 118 gals.
10. Gallons per day to each tap ..... 858 gals.
    (This is figured on taps in actual use, of which number 63,277 are metered, 201 elevator indicators and 436 unmetered. The latter consists of 189 Automatic Fire Sprinkler Systems. The remainder are Public Drinking Troughs, Bubblers, etc.)
11. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation ($400,535.09), $19.93.
12. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation, plus interest on bonds, $20.51.

STATISTICS RELATING TO DISTRIBUTION SYSTEM-MAINS.

1. Kind of pipe, cast iron.
2. Sizes from 4 to 42-inch.
3. Extended 27,300 lineal feet, 5.170 miles.
4. Discontinued, lineal feet, none.
5. Total now in use, 536,032 miles.
6. Cost of repairs per mile, including valves and boxes $11.21.
7. Number of leaks per mile .168.
8. Length of pipe less than 4 inches in diameter, none.
9. Number of hydrants added during the year, 46-3 cut out.
0. Number of hyrants now in use, 3,681.
1. Number of stop gates added during the year, 85.
2. Number of stop gates now in use, 4,286.
3. Number of stop gates smaller than 4-inch, 1.

(In addition to the above gates there are 2,082 gates from 2 inches to 8 inches controlling branch connections.)

4. Number of blow-offs, 63.
5. Range of pressure on mains, 20 to 90 pounds.

SERVICES.

6. 17, 18, 19, 20, 23, 24. All services put in by consumer.
1. Number of services (taps and branches) added during the year, 2,597.
2. Number of services connected to mains, 81,326 taps and 2,082 branches, a total of 83,408.
5. Number of meters added during the year, 1,815.
6. Number of meters now in use, 63,277 after deducting meters permanently off.
7. *Percentage of services metered, 99.
8. Percentage of receipts from metered water, 93.87.
9. Number of motors and elevators added, none; 11 taken out.
0. Number now in use, 201.

*Figured on services in actual use, of which 63,277 are metered, 201 evator indicators and 436 unmetered. The latter consists of 189 Automatic Fire Sprinkler Systems. The remainder are Public Drinking Troughs, ubblers, etc.

Note—A more complete report of the water works is published under parate cover giving the detailed activities of each division of the water orks, which report may be had on request.

THE LIBRARY OF THE
NOV 1 9 1942
UNIVERSITY OF ILLINOIS

Mun. Ref.

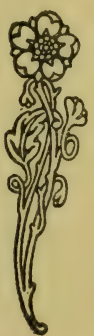
ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN SEVENTEEN

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN

COMPLIMENTS OF

PERCY BRAMAN

DEPUTY COMMISSIONER OF PUBLIC WORKS

MILWAUKEE, WIS.

1917 REPORT

PLEASE EXCHANGE

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN SEVENTEEN

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN SEVENTEEN

352.5
M69
1917

Department of Public Works

PERCY BRAMAN

Deputy Commissioner of Public Works

CHARLES J. VAN ETTA....*Supt. Bureau Street Construction and Repair.*
CHARLES O. DAVIS.....*Supt. Bureau of Street Sanitation.*
DAVID McKEITH.....*Supt. Bureau of Bridges and Public Buildings.*
GEORGE F. STAAL.....*City Engineer, Bureau of Engineering.*
H. P. BOHMANN.....*Supt. Water Works.*
AL. A. FRYMARK.....*Head Clerk.*

Office of

THE DEPARTMENT OF PUBLIC WORKS.

Milwaukee, May, 1918.

To the Honorable Mayor and Common Council of the City of Milwaukee:

Gentlemen:

Submit herewith the report of this department for the year 1917 under captions embracing the various bureaus of the department, these reports being over the signature of the bureau heads.

Very truly yours,

PERCY BRAMAN,

Deputy Commissioner of Public Works.

Milwaukee, Wis., May 15, 1918.

Mr. Percy Braman,

Deputy Commissioner of Public Works.

Dear Sir:

I herewith submit the annual report of the Department of Public Works for the year ending December 31st, 1917.

The report embraces the work of the Audit and Account and the Assessment Division, also giving in detail the following information:

Statement of net expenditures of the department and its various bureaus.

List of contracts awarded.

Number of permits issued, and revenue received.

List of streets placed under guarantee during 1917.

List of streets improved, with yardage and cost of each.

Inventory of the department by Bureaus.

Statement of all special assessments.

The report of 1917 is compiled on the basis of the report of the preceding year with little or no material change.

Respectfully submitted,

AL. A. FRYMARK,

Head Clerk.

Accounting Division

Statement of Net Expenditures for the Year Ending December 31, 1917, of the

DEPARTMENT OF PUBLIC WORKS,

Divided According to its Bureaus.

GENERAL ADMINISTRATION.

Administration—		
Salaries—Commissioner, etc.	$11,159.56	$ 1,800.00
Supplies—Office	61.72	
Contract or Open Order Service—Repairs, etc.	21.75	
Fixed Charges—Advertising, etc.	2,487.29	
Equipment—Office	25.00	
	$13,755.32	$ 1,800.00
Audit and Accounts—		
Salaries—Chief Clerk, etc.	$ 7,508.72	
Supplies—Office	655.56	
Contract or Open Order Service—Repairs, etc.	51.10	
	$ 8,215.38	
Special Assessments—		
Salaries—Chief Assessment Clerk, etc.	$ 7,044.10	
Supplies—Office	193.65	
Contract or Open Order Service—Repairs	18.80	
Equipment—Office	14.00	
Advertising and Appraisals	521.18	
	$ 7,791.73	

BUREAU OF PURCHASES AND SUPPLIES.

Purchasing—		
Salaries—Chief Clerk, etc.	$ 3,540.00	
Supplies—Office, etc.	449.34	
Contract or Open Order Service—Repairs, etc.	21.52	
Equipment—Office	134.00	
	$ 4,144.86	
Storage of Supplies—		
Salaries—Storekeeper, etc.	$ 4,300.30	
Supplies—Office, etc.	120.53	
Contract or Open Order Service—Repairs, etc.	1,546.49	
Fixed Charges—Insurance, etc.	330.89	
Equipment—Office	78.70	
	$ 6,376.91	
Storage of Supplies—Special Fund		
Stores—Stock	$45,357.13	$41,407.7
Miscellaneous Accts. Rec.		2,151.0
	$45,357.13	$43,558.8

BUREAU OF BRIDGES AND PUBLIC BUILDINGS.

Administration—		
Salaries—Superintendent, etc.	$14,311.06	
Supplies—Office, etc.	524.36	$ 91.20
Minor Instruments—Drawings, etc.	7.39	
Contract or Open Order Service—Repairs, etc.	132.20	
Equipment—Office, etc.	89.10	
	$15,064.11	$ 91.20
Construction—		
State Street Bridge	$ 5.75	
North Avenue Viaduct	786.94	
Gordon Park Bridge	87.75	
La Fayette Railing	557.58	
Bridge Yard	2,343.80	
Blue Mound Sanitarium Dining Hall	39,948.75	
South View Hospital	11,992.25	$ 3.30
Jackson Street Natatorium	40.00	
Fifth Avenue Natatorium	26,366.47	
Police Station	10,167.08	
Fire House No. 32	182.01	
	$92,478.38	$ 3.30
Bridges and Viaducts—		
Superintendence—		
Salary—Superintendence	$ 1,354.84	
Supplies—Fuel, etc.	16.00	
Contract or Open Order Service—Repairs, etc.	146.41	
	$ 1,517.25	
Maintenance—		
Salaries—Iron Workers, etc.	$18,387.53	$ 1,049.08
Supplies—Fuel, etc.	317.08	
Minor Instruments—Tools, etc.	331.90	
Material—General	10,956.40	1,791.78
Contract or Open Order Service—Repairs, etc.	7,703.10	944.61
Special Fund—Bridge Repairs	42,710.12	14,937.56
Miscellaneous Accounts Receivable		865.40
	$80,406.13	$19,588.43
Operation—		
Salaries—Bridge Tenders, etc.	$86,653.01	$ 15.13
Supplies—Fuel, etc.	3,170.24	
Minor Instruments—Tools, etc.	38.44	
Contract or Open Order Service—Light, Power, etc.	715.75	
Equipment	77.15	
	$90,654.59	$ 15.13

City Hall—		
Heat and Power—		
Salaries—Engineers, etc.	$12,389.74	$ 13.58
Supplies—Fuel, etc.	21,614.92	
Minor Instruments—Tools, etc.	76.14	
Material—General	1,432.23	53.92
Contract or Open Order Service—Repairs, etc.	4,725.66	
	$40,238.69	$ 67.50
Electrical Service—		
Salaries—Electrician, etc.	$ 3,863.33	$ 753.34
Supplies—General, etc.	1,128.91	1,047.23
Minor Instruments—Tools, etc.	27.64	
Material—General	1,034.10	1,365.44
	$ 6,053.98	$ 3,166.01
Janitorial Service—		
Salaries—Custodian, etc.	$17,949.13	
Supplies—Cleaning and Disinfecting	410.23	
Minor Instruments—Tools, etc.	81.00	
Contract or Open Order Service—Repairs	2.55	
	$18,442.91	
Elevator Service—		
Salaries—Elevator Operators, etc.	$ 4,807.50	$ 88.00
Material—General	530.72	
Contract or Open Order Service—Repairs, etc.	967.41	
	$ 6,305.63	$ 88.00
Telephone Service—		
Contract or Open Order Service, Telephone Service.	$ 3,703.60	$ 899.80
	$ 3,703.60	$ 899.80
General Service.		
Salaries—Watchman, etc.	$ 1,020.00	
Supplies—General	259.67	
Minor Instruments—Tools, etc.	472.15	
Material—General	302.62	$ 10.78
Contract or Open Order Service—Repairs, etc.	7,422.93	
	$ 9,477.37	$ 10.78
Markets—		
Central Market—		
Salaries—Market Master	$ 960.00	
Supplies—Fuel, etc.	43.13	
Material—General	25.94	
Contract or Open Order Service—Repairs, etc.	1,675.18	
Special Fund	1.20	
	$ 2,705.45	

Natatoria—

Center Street Natatorium—

Salaries—Superintendent, etc.	$ 3,991.18	
Supplies—Fuel, etc.	1,811.08	
Minor Instruments—Tools, etc.	21.17	
Material—General	21.97	
Contract or Open Order Service—Repairs, etc.	1,965.45	
Fixed Charges—Insurance, etc.	5.00	
	$ 7,815.85	

Jackson Street Natatorium—

Salaries—Natatorium Assistants, etc.	$ 3,814.33	
Supplies—Fuel, etc.	5,967.15	
Minor Instruments—Tools, etc.	15.24	
Material—General	20.59	
Contract or Open Order Service—Repairs, etc.	1,835.35	
Fixed Charges—Insurance, etc.	5.00	
	$11,657.66	

Greenbush Street Natatorium—

Salaries—Superintendent, etc.	$ 4,296.85	
Supplies—Fuel, etc.	2,449.58	
Minor Instruments—Tools, etc.	6.83	
Material—General	14.23	
Contract or Open Order Service—Repairs, etc.	2,027.50	
Fixed Charges—Insurance, etc.	5.00	
	$ 8,799.99	

Greenfield Avenue Natatorium—

Salaries—Superintendent, etc.	$ 4,000.43	
Supplies—Fuel, etc.	2,539.51	
Minor Instruments—Tools, etc.	6.95	
Material—General	15.65	
Contract or Open Order Service—Repairs, etc.	1,267.15	
Fixed Charges—Insurance, etc.	5.00	
	$ 7,834.69	

North Avenue Natatorium—

Salaries—Superintendent, etc.	$ 4,837.02	
Supplies—Fuel, etc.	1,738.98	
Minor Instruments—Tools, etc.	3.56	
Material—General	26.43	
Contract or Open Order Service—Repairs, etc.	1,956.15	
Fixed Charges—Insurance, etc.	5.00	
Miscellaneous Accounts Receivable		$ 377.05
	$ 8,567.14	$ 377.05

Prairie Street Natatorium—		
Salaries—Superintendent, etc.	$ 4,121.33	
Supplies—Fuel, etc.	3,389.21	
Minor Instruments—Tools, etc.	36.12	
Material—General	9.34	
Contract or Open Order Service—Repairs, etc.	2,411.08	
Fixed Charges—Insurance, etc.	5.00	
	$ 9,972.08	
Bathing Beaches—		
McKinley Park Bath House—		
Salaries—Superintendent, etc.	$ 5,337.48	
Supplies—Fuel, etc.	513.79	
Minor Instruments—Tools	11.47	
Material—General	42.87	
Contract or Open Order Service—Repairs, etc.	917.05	
Fixed Charges—Bond, etc.	5.00	
Equipment—General, etc.	2,987.88	
	$ 9,815.54	
South Shore Park Bath House—		
Salaries—Superintendent, etc.	$ 4,838.30	
Supplies—Fuel, etc.	204.57	
Minor Instruments—Tools, etc.	37.10	
Material—General	18.18	
Contract or Open Order Service—Repairs, etc.	692.75	
Fixed Charges—Bond, etc.	5.00	
Equipment—General, etc.	1,869.48	
	$ 7,665.38	
Comfort Stations—		
First Avenue Viaduct—		
Supplies—Fuel, etc.	$ 84.51	
Material—General	1.15	
Contract or Open Order Service—Gen'l Service, etc.	471.17	
	$ 556.83	
Municipal Garage—		
Salaries—Superintendent, etc.	$ 7,829.76	
Supplies—General, etc.	13,788.26	
Equipment—General, etc.	692.86	
Material—General	2,655.82	
Contractor or Open Order Service—Repairs, etc.	1,125.37	$ 6,543.80
Fixed Charges—Insurance, etc.	651.50	
Equipment—Motor Vehicle, etc.	7,954.80	525.00
Special Fund—Garage Equipment	4,656.95	
	$39,355.32	$ 7,068.80

BUREAU OF ILLUMINATION.

Street Lighting—		
Salaries and Miscellaneous	$29,614.32	
Electric Lighting	155,937.55	
Gas Lighting	70,759.12	
Naptha Lighting	10,746.45	
Miscellaneous Accounts—Receivable		$ 132.40
	$267,057.44	$ 132.40
Safety Island Lighting—		
Special Fund—Safety Islands	$ 548.22	
	$ 548.22	
Auditorium Lighting—		
Special Fund—Auditorium	$ 395.62	
	$ 395.62	
Construction—		
Special Fund—Construction	$366,028.84	
Miscellaneous Accounts—Receivable		$ 888.32
	$366,028.84	$ 888.32

BUREAU OF SEWERS.

Administration—		
Salaries—Superintendent, etc.	$ 6,102.13	
Supplies—Office, etc.	209.42	
Contract or Open Order Service—Repairs, etc	271.87	
Equipment—Office, etc.	34.00	
	$ 6,617.42	
Store Yards—		
Salaries—Labor, etc.	$ 3,637.66	
Supplies—Forage and Veterinary, etc	2,048.48	
Material—General	.12	
Contract or Open Order Service, Repairs, etc	1,239.57	
Miscellaneous Accounts—Receivable		259.51
	$ 6,925.83	$ 259.51
Cleaning and Flushing—		
Salaries—Labor, etc.	$15,708.60	
Supplies—General, etc.	195.11	
Contract or Open Order Service—Team Hire, etc	6,111.40	
Fixed Charges—Rent	3,731.00	
Equipment—General	1,289.66	
Miscellaneous Accounts—Receivable		$ 963.95
	$27,035.77	$ 963.95

Repairs—		
Salaries—Labor, etc.	$12,060.05	
Material—Sewer	2,198.89	
Material—General	282.50	
Contract or Open Order Service—Gen'l Service	213.35	
Miscellaneous Accounts—Receivable		$ 2,321.14
	$14,754.79	$ 2,321.14
Construction—City—		
Salaries—Labor, etc.	$88,447.15	
Miscellaneous Accounts—Receivable		$ 1,465.08
	$88,447.15	$ 1,465.08
Construction—Contract—		
Concrete Sewer	$52,031.51	
Pipe Sewer	84,739.24	
Test Borings	2,193.48	
	$138,964.23	

BUREAU OF STREET CONSTRUCTION AND REPAIRS.

Superintendence—		
Salaries—Superintendent, etc.	$ 8,774.50	
Supplies—Office, etc.	303.82	
Contract or Open Order Service—Repairs, etc.	1,609.20	
Equipment—Office	146.80	
	$ 10,834.32	
Testing Laboratory—		
Salaries—Chemist, etc.	$ 2,640.00	
Supplies—Laboratory, etc.	91.93	
Minor Instruments—Apparatus, etc.	22.07	
Contract or Open Order Service—Repairs, etc.	70.81	
Equipment—Laboratory	102.38	
Miscellaneous Accounts—Receivable		$ 144.00
	$ 2,927.19	$ 144.00
Construction—		
Creosote Block Paving	$ 70,739.26	
Asphalt Paving	787,401.11	
Brick Paving	59,749.92	
Stone Block Paving	132,612.84	
Re-cut Granite Paving	3,136.67	
Bituminous Concrete Paving	196,805.61	
Concrete Paving	53,980.47	
Sidewalk, Grading, etc.	37,332.59	
Miscellaneous—Insp.—Advertising, etc.	24,059.18	$ 4,833.39
	$1,365,817.63	$ 4,833.39

Contract Retainer—		
Retainer Paid	$ 7,000.00	
Interest Paid	3,568.28	
	$ 10,568.28	
Pavement Repairs—		
Salaries—Foremen, etc.	$ 11,674.83	
Supplies—General	349.04	
Minor Instruments—Tools, etc	193.95	
Contract or Open Order Service	6,997.06	
Equipment—Self-Propelled Apparatus	19,935.49	
Special Fund	158,190.03	$22,708.72
Miscellaneous Accounts—Receivable		516.44
	$197,340.40	$23,225.16
Repair Shop—		
Salaries—Foremen, etc.	$ 3,167.42	
Supplies—Fuel, etc.	98.31	
Minor Instruments—Tools, etc	60.82	
Contract or Open Order Service—Livery Hire, etc.	127.73	
Equipment—General	200.00	
Special Fund	2,100.00	
	$ 5,754.28	
Miscellaneous Minor Repairs—		
Salaries—Labor	$ 13,447.27	
Material—Highway	15,268.67	
Contract or Open Order Service—Team Hire	7,433.93	
Special Fund	2,840.69	
	$ 38,990.56	
Sidewalk Repairs and Replacements—		
Salaries—Labor, etc.	$ 10,960.47	
Supplies—General, etc.	385.81	
Minor Instruments—Tools, etc.	21.58	
Material—Highway	8,075.01	
Contract or Open Order Service—Team Hire, etc.	828.94	
Special Fund	1,639.92	
Miscellaneous Accounts—Receivable		$ 194.58
	$ 21,911.73	$ 194.58
Rotary Fund—		
Salaries—Labor	$ 8,033.41	
Miscellaneous Accounts—Receivable		$ 9,777.45
	$ 8,033.41	$ 9,777.45

Track Elevation and Depression—		
Special Fund	$ 25,523.54	
Miscellaneous Accounts—Receivable		$ 824.24
	$ 25,534.54	$ 824.24

BUREAU OF STREET SANITATION.

Superintendence—		
Salaries—Superintendent, etc.	$ 8,880.07	
Supplies—Office, etc.	724.04	
Contract or Open Order Service—Motor Vehicle Repairs, etc	$ 215.05	
	$ 9,819.16	
Field—		
Salaries—Supervision, etc.	$ 40,650.34	
	$ 40,650.34	
Street Cleaning—		
Salaries—Labor, etc.	$124,551.58	
Supplies—General	1,155.78	
Minor Instruments—Tools, etc.	2,085.10	
Contract or Open Order Service—Team Hire, etc.	52,063.96	
Equipment—Self-Propelled Apparatus	4,130.00	
Miscellaneous Accounts—Receivable		$ 64.38
	$183,986.42	$ 64.38
Removing Snow from Streets—		
Salaries—Labor, etc.	$ 25,911.98	
Supplies—General	359.53	
Minor Instruments—Tools, etc.	214.09	
Material—Highway	51.24	
Contract or Open Order Service—Team Hire, etc.	10,659.21	
Equipment—Horsedrawn Apparatus	555.00	
Miscellaneous Accounts—Receivable		$ 14.40
	$ 37,751.05	$ 14.40
Collection of Ashes and Rubbish—		
Salaries—Labor, etc.	$122,290.72	
Supplies—Office, etc.	218.47	
Minor Instruments—Tools, etc.	968.67	
Contract or Open Order Service—Team Hire, etc.	144,981.83	
Miscellaneous Accounts—Receivable		$ 35.77
	$268,459.69	$ 35.77

Garbage Collection—

Salaries—Superintendent, etc.	$ 2,143.50	
Supplies—Motor Vehicle, etc.	348.91	
Material—General	1.27	
Contract or Open Order Service—Team Hire, etc.	129,927.25	
Miscellaneous Accounts—Receivable		$ 100.00
	$132,420.93	$ 100.00

Removal of Dead Animals—

Contract or Open Order Service—Team Hire, etc.	$ 1,808.00	
Miscellaneous Accounts—Receivable		$ 60.00
	$ 1,808.00	$ 60.00

Cleaning Catch Basins—

Salaries—Labor, etc.	15,679.83	
Supplies—General	1,212.67	
Minor Instruments—Tools, etc.	8.00	
Contract or Open Order Service—Team Hire, etc.	10,872.12	
Equipment	13,500.00	
	$ 41,272.61	

Ward Yards—

Salaries—Superintendent, etc.	$ 3,299.15	
Supplies—Horsedrawn Apparatus, etc.	457.88	
Minor Instruments—Tools, etc.	157.22	
Material—General	472.89	
Contract or Open Order Service—Team Hire, etc.	1,222.72	
Fixed Charges—Rent, etc.	763.34	
Special Fund	4,500.00	
Miscellaneous Accounts—Receivable		$ 76.63
	$ 10,873.20	$ 76.63

Rotary Fund—

Street End Barricade	$ 492.94	
Cinders	2,313.64	
Dredge Kinnickinnic River	951.29	
	$ 3,757.87	

Public Drinking Fountains—

Salaries—Labor, etc.	$ 327.22	
Material—General	.92	
Contract or Open Order Service—Repairs, etc.	9,086.66	
Special Fund—New Bubblers, etc.	610.64	
	$ 10,025.44	

Skating Rinks—			
Salaries—Labor, etc.	$ 774.50		
Contract or Open Order Service—Team Hire, etc.	270.30		
	$ 1,044.80		
Street Signs—			
Salaries—Labor, etc.	$ 522.58		
Supplies—General	.11		
Material—General	101.89		
Special Fund—New Signs	645.40		
Special Fund—Board Signs	10.00		
	$ 1,279.98		
Special Work—			
Salaries—Labor, etc.	$ 27,410.75		
Contract or Open Order Service—Team Hire, etc.	21,709.01		
Miscellaneous Accounts—Receivable		$50,498.91	
	$ 49,119.76	$50,498.91	
Sprinkling, Flushing and Oiling—			
Salaries—Superintendent, etc.	$ 15,805.48		
Supplies—Horsedrawn Apparatus, etc.	9,716.81		
Minor Instruments—Tools, etc.	298.36		
Material—Highway	104,163.56		
Material—General	148.70		
Contract or Open Order Service—Team Hire, etc.	85,961.95		
Fixed Charges—Rent, etc.	10,270.25		
Equipment—Self-Propelled	13,523.64		
Miscellaneous Accounts—Receivable		$ 907.63	
	$239,888.75	$ 907.63	
Assessable Service—			
Salaries—Labor	$ 10,909.99		
Team Hire	2,884.02		
Miscellaneous Accounts—Receivable		$ 111.57	
	$ 13,794.01	$ 111.57	

BUREAU OF RIVERS AND HARBORS.

Harbor Commission—		
Salaries—Secretary	$ 1,800.00	
Supplies—Office	16.19	
Contract or Open Order Service—Postage, etc.	28.80	
Fixed Charges—Publications	113.34	
Equipment—Office	49.80	
	$ 2,008.13	

Harbor Master—		
Salaries—Harbor Master	$ 1,200.00	
Supplies—Motor Vehicle	33.29	
Contract or Open Order Service—Repairs, etc	51.40	
	$ 1,284.69	
Docking and Dredging—		
Salary—Inspection	$ 1,291.00	
Dredging	17,739.64	
Harbor Improvements	219,717.37	
Miscellaneous Accounts Receivable		$ 1,538.00
	$238,748.01	$ 1,538.00

MISCELLANEOUS.

House Drains and Water Connections—		
Salaries—Inspection	$ 1,760.00	
Connections	52,833.45	
Miscellaneous Accounts—Receivable		$ 28.60
	$ 54,593.45	$ 28.60
City Property—		
Rents		$29,180.39
Miscellaneous Accounts—Receivable		540.00
		$29,720.39

List of Contracts

Awarded by

the

Department of Public Works

During the Year 1917

LIST OF CONTRACTS AWARDED BY THE DEPARTMENT OF PUBLIC WORKS DURING 1917.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
6	Jan. 23, 1917.....	White Automobile Co.....	1 oil truck and 1 stone truck.....	$ 11,833.50
8	Jan. 23, 1917.....	Warren Bros. Co.....	Construct asphalt plant.....	6,490.00
11	Jan. 31, 1917.....	Western Lime & Cement Co.....	5,000 bbls. Portland cement.....	10,900.00
12	Jan. 31, 1917.....	White Rock Quarry Co.....	200 sq. yds. hard sandstone.....	354.00
13	Jan. 31, 1917.....	Ricketson & Schwarz.....	40,000 paving bricks.....	870.00
14	Jan. 31, 1917.....	Badger Construction Co.....	50 tons asphalt cement.....	1,242.50
15	Jan. 31, 1917.....	Central Creosoting Co.....	500 sq. yds. creosote wood blocks.....	750.00
16	Feb. 10, 1917.....	Manger & McGucken Const. Co....	Cut., asphalt top rem., concrete rem., creosote blk. pav'g., 13th St., from S. L. of Grand Avenue to S. L. of Lot 9, Blk. 253, Rogers' Subd., 4th Wd.....	8,164.05
17	Feb. 10, 1917.....	Frank Banaszak	Cut., sidewalks, Chase St., from Greenbush St. to Hanover St., 17th Ward	2,032.56
18	Feb. 10, 1917.....	Wisconsin Const. Co.....	Cut., flg., bitum. concrete paving, comb. curb and gut., sidewalks, Hawley Road (55th St.), from N. L. of Vliet St. to S. L. Pabst Ave., 19th Ward.....	26,036.99
19	Feb. 10, 1917.....	Wisconsin Const. Co.....	Cut., bitum. concr. pavg., creosote blk. pavg., brick gut., Sheridan Lane from N. L. of Vliet St., to S. L. of Cherry St., 9th Ward.	2,630.29
20	Feb. 10, 1917.....	Badger Const. Co.....	Cut., flg., asphalt pavg., curb and gut., sidewalks, 52nd St., from N. L. of Washington Blvd. to a pt. 366 ft. South of S. L. of Vine St.	3,347.88

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
21	Feb. 10, 1917.....	F. P. Caughlin Co.....	Cut., asphalt pavg., brick gutter, str. curb, rad. curb, reset, Galena St., from W. L. of 13th St. to E. L. of 20th St.....	26,854.79
22	Feb. 10, 1917.....	White Const. Co.....	Cut., fig., asphalt pavg., brick gutter, curb reset, str. curb, rad. curb, reset, 2nd Ave., from S. L. of Windlake Ave. to N. L. of Lincoln Ave.	38,597.58
23	Feb. 10, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., brick gutter, bitum. concrete paving, N. & S. alley in blk. betw. Texas Ave., Illinois Ave., Superior St. and Wentworth Ave., 17th Ward, Blk. 19, Lakeside Park No. 3.....	1,876.21
24	Feb. 10, 1917.....	Frank Schomann	Cut., fig., sidewalks, 9th St., from N. L. Graham St. to N. L. continuation of Williamsburg Heights	765.10
25	Feb. 10, 1917.....	Michael Dunn	Comb. curb and gutter, old curb and gutter removed, curb and gutter reset, Island Ave., from Lee St. to Wright St.....	1,050.00
26	Feb. 10, 1917.....	A. Froemming & Alb. Retzlaff.....	Cut., fig., sidewalks, 15th St. from Finn Pl. to N. L. of Irving Park; Nash St. from 17th St. to E. L. of Teutonia Ave., 18th St. from Finn Pl. to Nash St., 25th Ward.....	5,260.52
31	Mar. 1, 1917.....	John Weiher (assigned to Milwaukee Gen'l Const. Co.)	Cut., fig., old pavement rem., bitum. concre. pavg., brick gutter, Orchard St., from W. Curb Line of 1st Ave. to E. Curb Line of 5th Ave.....	5,331.51
32	Mar. 1, 1917.....	Geo. Czerwinski	Cut., new str. curb, rad. curb, reset, brick pavg., 10th St., from N. L. St. Paul Ave. to S. L. of Clybourn St.....	5,622.75

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
33	Mar. 1, 1917.....	Wisconsin Const. Co.....	Cut., flg., bitum. concr. pavg., curb and gutter, reset, Groeling Ave. from W. L. of Louis Ave. to E'ly L. Teutonia Ave.....	5,028.99
34	Mar. 1, 1917.....	Fred Hildebrand, Jr.....	Cut., drain tile, cement concrete pavg., Alley in Blk. 9, Palmer & Co.'s Add'n., betw. 29th, 30th, Clybourn and St. Paul Ave., 16th Ward	1,310.36
35	Mar. 1, 1917.....	Dean Construction Co.....	Cut., cement concrete pavg., drain tile, Alley in Blk. 40, J. L. Pierce's Subd., betw. Richards, Buffum, Lee Sts. and North Ave., 13th Ward	2,581.40
36	Mar. 1, 1917.....	Dean Construction Co.....	Cut., flg. stone curb, rad. curb reset, rad. curb, hard sandstone pavement, Greenfield Avenue, from W. L. of Clinton St. to E. L. of Barclay St.....	7,813.39
37	Mar. 1, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., brick gutter, bitumin. concrete pavg., Alley in Blk. 4, Weil, Wechselberg & Cramer's Subd., betw. 7th, 8th, Lincoln and Hayes Aves.	2,189.38
38	Mar. 1, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., brick gutter, bitum. concrete pavg., Alley in Blk. 1, Weil, Wechselberg & Cramer's Subd., betw. Midland, 5th, Lincoln and Hayes Avenues	1,573.29
39	Mar. 1, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., cement concrete pavg., drain tile, Alley in Blk. 11, Hopkins & Hadley's Subd. No. 3, betw. 9th and 10th, Arthur and Harrison Aves.	4,192.40

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
52	Mar. 13, 1917.....	Wisconsin Construction Co.....	Cut., flg., brick gutter, bitumin. concre. pavg., Alley in Blk. betw. Linnwood Ave., Kenwood Blvd., Oakland Ave. and Bartlett Ave., 18th Ward.....	2,103.56
53	Mar. 13, 1917.....	John H. Donahue.....	Cut., drain tile, cement concrete pavg., Alley in Blk. 4, Forster, Folsom & Brands, Blk. 3, continuation of Newberry Hill, betw. Linnwood, Folsom, Cramer & Murray Avenue.....	2,188.23
54	Mar. 13, 1917.....	Badger Construction Co.....	Old concr. found. rem., old pavement rem., asphalt pavement, brick gutter, new str. curb, rad. curb, reset, new concrete, Grand Avenue, from W. L. of 13th Street to E. L. of 27th Street	67,700.75
			1,200 sq. yds. limestone paving blocks.....	1,500.00
55	Mar. 13, 1917.....	Walter E. Lippmann.....		
56	Mar. 14, 1917.....	Wisconsin Cem. Const. Co.....	Cut., flg., brick gutter, bitum concr. pavg., Alley Blk. 5, Riverside Park Subd., and Blk. 5, con't. Riverside Park Subd., betw. Bartlett Ave., Newhall, Park Place and Riverside Drive.	2,565.73
68	Mar. 29, 1917.....	Frank Banaszak	Cut., flg., sidewalks, South Pierce St., from Western Ave. to 34th Avenue	2,365.05
69	Mar. 30, 1917.....	F. P. Caughlin Co.....	Cut., asphalt, brick gutter, cement curb, new limestone curb, reset, Kane Place from E. L. of Prospect Ave. to E. L. of Summit Ave.	2,663.15

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
70	Mar. 30, 1917.....	F. P. Caughlin Co.....	Cut., standard asphalt, brick gutter, new straight curb, rad, curb, reset, Cambridge Ave., from Brady to Bolyston Place, and portions of Oakland and Bartlett Aves.....	18,285.17
71	Mar. 29, 1917.....	Retzlaff & Froemming.....	Cut., filling, cement concrete paving, drain tile, Bluhm Place, from N. L. of Burleigh St. to N. L. of Auer Avenue, and also Alley running East and West betw. Island, Achilles, Burleigh and Auer Avenue.....	3,043.01
72	Mar. 29, 1917.....	Milwaukee General Const. Co.....	Cut., bitum. concrete pavg., comb. cement curb and gutter, Kearney Pl. from W. L. of 13th Avenue to E. L. of 14th Avneue, and Arthur Avenue, from W. L. of 13th Avenue to E. L. of 14th Avenue	5,607.70
73	Mar. 29, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., bitum. concre. pavg., brick gutter, straight curb, rad. curb, reset, Chase St., from E. L. of 1st Avenue to W. L. of Chicago Avenue	2,534.10
74	Mar. 29, 1917.....	Wisconsin Construction Co.....	Cut., fig., bitum. concr., cement curb and gutter, sidewalks, Galena Street, from W. L. of 51st St. to E. L. Hawley Road, includ. crossing of 54th Street...	8,907.68
75	Mar. 29, 1917.....	Fred Hildebrand, Jr.....	New. Concrete foundation, creosote blk. paving, old pavement removed, reset, rad. curb, 11th Street, from North Rail on Vliet Street to S. L. of Walnut Street.....	26,292.41

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
76	Mar. 29, 1917.....	Dean Construction Co.....	Cut., rad. curb, radius curb reset, granite pavement removed, recut, relaid, 10th St., from N. L. of Prairie St. to S. L. of Winnebago St.	14,254.63
77	Mar. 30, 1917.....	Badger Construction Co.....	Cut., asphalt paving, brick gutter, straight curb, radius curb, reset, on Cedar Street, from E. L. of 16th Street to W. L. of 24th Street	27,912.79
95	Apr. 16, 1917.....	Wisconsin Construction Co.....	Cut., brick gutter, bitum. concrete, Alley Blk. 15, Rice's Subd., betw. 25th, 26th, Center and Hadley Streets, 20th Ward.....	3,249.65
96	Apr. 16, 1917.....	Retzlaff & Froemming.....	Cut., brick gutter, bitum. concrete, Alley, Blk. 3, Florence Investment Co.'s Subd. No. 3, Badger State Park, betw. 22nd, 23rd, Chambers and Burleigh Sts., 20th Ward.....	2,483.42
97	Apr. 16, 1917.....	Wisconsin Construction Co.....	Cut., brick gutter, bitum. concrete, Alley Blk. 1, Wm's. Addition No. 1, Blk. 1, Washington Ave. Addition, Blk. 1, Atlas Land Co.'s Subd. and Blk. 10, Rice's Subd., betw. 25th, 26th, Hadley and Locust Sts., in the 20th Ward.....	3,042.10
98	Apr. 16, 1917.....	Retzlaff & Froemming.....	Cut., brick gutter, bitum. concrete, Alley Blk. 10, Florence Investment Co.'s Subd. No. 1, and Blk. 1, Badger State Park, betw. 20th, 21st, Chambers and Burleigh Sts., 20th Ward.....	2,223.81
99	Apr. 16, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., bitum. concrete, combin. curb and gutter, sidewalks, 13th Ave., from N. L. of Arthur Avenue to N. W'ly line of Windlake Ave.	3,460.06

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
100	Apr. 16, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., bitum. concrete, brick gutter, new straight curb, rad. curb, reset, Garden St., from N. L. of Harrison Ave. to S. L. of Chicago Ave.	9,943.67
101	Apr. 16, 1917.....	Manger & McGucken Const. Co....	Cut., brick pavement, straight sandstone curb, rad. sandstone curb, 22nd Street, from N. L. of Clybourn Street to S. L. of Sycamore Street 6	5,003.94
102	Apr. 16, 1917.....	Albert H. Prange.....	Old pavement removed, creosote blk. pavmt., stra. curb, reset, new concrete foundation, Virginia Street, from W. L. of Grove Street to N. L. of Park Street.....	31,712.93
103	Apr. 16, 1917.....	Manger & McGucken Const. Co....	Cut., flg., brick paving, strai. sandstone curb, rad. sandstone curb, Clybourn Street, from W. L. of 20th Street to W. L. of 25th Street	27,093.04
104	Apr. 17, 1917.....	F. P. Caughlin Co.....	Cut., asphalt, brick gutter, strai. curb, rad. curb, reset, Van Buren St., from N. Curb Line of Mason St. to S. L. of Juneau Ave.	23,309.87
105	Apr. 17, 1917.....	Badger Const. Co.....	Cut., flg., asphalt paving, combin. cem. curb and gut., sidewalks, 54th St., from N. L. of Vine St. to S. L. of North Ave.....	18,188.84
120	May 1, 1917.....	Albert H. Prange.....	Cut., flg., sandstone pav., new strai. curb, radius curb, sidewalks, National Ave., from E. L. of Subway to W. L. of South Water St.	3,095.47

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
121	Apr. 28, 1917.....	F. P. Caughlin Co.....	Cut., asphalt, brick gutter, strai. curb, reset, Milwaukee St., from N. L. of Juneau Ave. to S. L. of Knapp St.....	3,921.62
122	Apr. 28, 1917.....	White Construction Co.....	Cut., fig., asphalt, brick gutter, strai. curb, reset, rad, curb, sidewalks, Windlake Ave., from S. L. of Lincoln Ave. to S. L. of 13th Ave.	26,946.42
123	Apr. 28, 1917.....	White Construction Co.....	Cut., asphalt, brick gutter, straight curb, rad. reset, rad. curb, str. curb reset, 11th Ave., from S. L. of Forest Home Ave., to N. L. of Windlake Ave.....	36,850.26
124	Apr. 28, 1917.....	Badger Construction Co.....	Cut., asphalt, brick gutter, str. curb, rad. curb, reset, Cedar St., from W. L. of 27th St. to E. L. of 35th St.....	27,730.93
125	Apr. 28, 1917.....	Badger Construction Co.....	Cut., fig., cem. curb and gutter, cem. curb, sidewalks, asphalt, Washington Blvd., from W. L. of 47th St. to West City Limits	51,168.34
127	May 4, 1917.....	Albert H. Prange.....	Cut., fig. sandstone, str. sandstone curb, old curb reset, radius sandstone curb, sidewalks, Florida St., from E. L. of Clinton St. to E. L. of Barclay St.....	8,961.82
136	May 4, 1917.....	Geo. Czerwinski	Concrete area walls (not reinforced), sidewalks, cement hollow steps, fig., cut., southeast corner of Clinton and Oregon Sts...	250.00
137	May 4, 1917.....	Lee Loader & Body Company.....	2 portable crushed stone loaders.....	670.00
147	May 17, 1917.....	F. P. Caughlin Co.....	Flg., asphalt, curb and gutter, 15th St., from N. L. of Finn Pl. to S. L. of Nash St.....	3,281.56

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
148	May 17, 1917.....	F. P. Caughlin.....	Old pavement removed, asphalt, brick gutter, Vliet St. (outside street railway zone) from W. L. of 11th St. to W. L. of 32nd St., and from W. L. of 35th St. to W. L. of Highland Blvd...	56,948.15
149	May 17, 1917.....	F. P. Caughlin Co.....	Old asphalt removed, asphalt, brick gut., Lisbon Ave. (outside street railway zone) from N. L. of Walnut St. to E. L. of 27th St.	7,148.20
150	May 17, 1917.....	Badger Construction Co.....	Cut., asphalt, brick gutter, straight curb, reset, 15th St., from N. L. of Grand Ave. to S. L. of Wells St.....	4,675.04
156	May 18, 1917.....	Jennison-Wright Co.	1,200 sq. yds. creosoted wooden blocks,.....	3,380.00
157	May 18, 1917.....	Wisconsin Const. Co.....	Cut., pavement removed, brick gutter, bitum. concrete, North Alley running E. and W. between 9th, 10th, Center and Hadley Sts., 25th Ward.....	1,340.80
158	May 18, 1917.....	Badger Construction Co.....	Cut., fig., bitum. concrete, curb and gutter, sidewalks, 54th street, from N. L. of Vliet St. to S. L. of Washington Blvd.....	11,314.20
159	May 18, 1917.....	Albert H. Prange.....	Old pavement removed, stone block (granite) pavement, straight curb, reset, 3rd St., from N. L. of Chestnut St. to S. L. of Cherry St. (outside street railway zone).....	16,669.59
160	May 22, 1917.....	Geo. Czerwinski	Cut., brick pavement removed, hard sandstone paving, straight curb, reset, radius, North Water St. (outside street railway zone) from East Water St. to Brady St., and Brady St., from North Water to E. L. of Van Buren St.....	55,199.78

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

No. Cont.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
161	May 22, 1917.....	Dean Const. Co.....	Cut., fig., brick pavement removed, hard sandstone, straight curb, reset, radius curb, Farwell Ave. (outside street railway zone) from N. L. of Windsor Pl. to S. L. of North Ave.....	9,978.81
162	May 23, 1917.....	Geo. Czerwinski	Reset sidewalks, replace sidewalks, reset comb. curb and gutter, new curb and gutter, 24th Ave., from Lapham St. to Mitchell St.	375.00
166	May 31, 1917.....	White Const. Co.....	Cut., fig., asphalt, curb and gutter, sidewalks, Midland Ave., from 270 feet North of Dakota St. to N. L. of Oklahoma Ave.....	16,214.95
167	May 31, 1917.....	F. P. Caughlin Co.....	Cut., fig., asphalt, curb and gutter, sidewalks, Hartford Ave., from E. L. of Oakland Ave. to 956.22 feet W. of Downer Ave.	13,155.97
168	May 31, 1917.....	F. P. Caughlin Co.....	Cut., fig., asphalt, curb and gutter, sidewalks, 17th St., from S. L. of Finn Pl. to S. L. of Nash St.....	5,811.16
169	May 31, 1917.....	F. P. Caughlin Co.....	Asphalt paving, Cramer St., from N. L. of Kenwood Blvd. to S. L. of Edgewood Ave.....	20,005.44
170	May 31, 1917.....	Badger Construction Co.....	Old asphaltic concrete removed, asphalt pavement, brick gutter, North Ave. (outside street railway zone) from W. L. of 27th St. to W. L. of 45th St.....	34,154.67
175	June 4, 1917.....	Fred Hildebrand, Jr.....	Cut., fig., old pavement removed, brick pavement, Alley between 3rd, 4th, State and Prairie Sts.....	4,797.36

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
176	June 4, 1917.....	Henry Hase	Cut., brick pavement, Alley between 29th, 33rd, Chestnut and Highland Blvd., 15th Ward.....	10,003.70
177	June 4, 1917.....	John H. Donahue.....	Cut., flg., old pavement removed, creosote block paving, Alleys in Block 51, between 3rd, 4th, Cedar and State Sts., 2nd Ward...	5,912.90
178	June 6, 1917.....	John H. Donahue.....	Old pavement removed, hard sandstone, Oneida St., from E. L. of Market St. to W. L. of Broadway.....	4,595.85
179	June 14, 1917.....	Wisconsin Construction Co.....	Cut., brick gutter, bitum. concrete pavg., Alley between 50th, 51st., Vine and Washington Blvd.....	2,571.30
203	June 19, 1917.....	F. P. Caughlin Co.....	Cut., flg., asphalt, stra. curb. gutter, rad. curb, 2-course Sidewalks, Richards St., from S. L. of Franklin to N. L. of Keefe Ave.	23,762.35
204	June 19, 1917.....	F. P. Caughlin Co.....	Cut., flg., asphalt, brick gutter, stra. sandstone curb, radius sandstone curb, sidewalks, Green Bay Ave., from a pt. 484 ft. N. of a pt. opp. the N. L. of Atkinson Ave. to approxm. the N. L. of Graham St., and 7th St., from N. L. of Lot 1, Blk. 1, Segnitz Subd. No. 1, to Green Bay Avenue.....	16,637.20
205	June 19, 1917.....	Badger Const. Co.....	Cut., asphalt, brick gutter, new stra. limestone curb, old str. limestone curb reset, 16th St., from N. L. of Cedar St. to S. L. of Prairie St.	9,608.76

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
206	June 18, 1917.....	White Construction Co.....	Cut., fig., asphalt pavement, comb. c. curb and gutter, 2-course cement sidewalks, 3rd Ave., from S. L. of Dakota St. to N. L. of Oklahoma Ave.....	18,159.24
207	June 18, 1917.....	White Construction Co.....	Cut., fig., asphalt pvg., brick gutter, new str. limestone curb, new radius limestone curb, old str. limestone curb reset, old gutter rem., Washington St., from W. L. of Reed St. to 1st Ave., except the crossing of Grove St.....	15,184.11
208	June 18, 1917.....	White Construction Co.....	Cut., fig., asphalt pavement, cement curb and gutter, 2nd Ave., from S. L. of Dakota St. to N. L. of Oklahoma Ave., except crossing of Manitoba St.....	12,031.31
209	June 18, 1917.....	White Construction Co.....	Cut., asphalt pavement, cement curb and gutter, Seventh Ave., from S. L. of Dakota St. to N. L. of Oklahoma Ave.....	12,251.49
210	June 18, 1917.....	White Construction Co.....	Cut., fig., asphalt pavement, cement curb and gutter, 6th Ave., from S. L. of Dakota St. to N. L. of Oklahoma Ave.....	11,936.40
211	June 18, 1917.....	White Construction Co.....	Cut., fig., sheet asphalt pavement, cement curb and gutter, 5th Ave., from S. L. of Dakota St. to N. L. of Oklahoma Ave....	12,421.11
212	June 18, 1917.....	White Construction Co.....	Cut., fig., asphalt pavement, cement curb and gutter, 4th Ave., from S. L. of Dakoto St. to N. L. of Oklahoma Ave.....	11,084.53
213	June 19, 1917.....	Manger & McGucken Const. Co....	Cut., fig., old pavem. remov., hard sandstone pav., cement curb, Huron St., from W. L. of East Water St. to Milwaukee River.	3,454.25

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
214	June 19, 1917.....	Retzlaff & Froemming.....	Cut., cement concr. pavement, drain tile, Alley in Blk. between 2nd, 3rd, Ring St. and Concordia Ave.....	1,734.41
220	July 19, 1917.....	Walter E. Lippmann.....	Gutter removed, gutter repaved, new straight curb, old curb reset, on 31st and 32nd Sts., from Sycamore St. to St. Paul Ave.	2,967.80
221	July 19, 1917.....	Milwaukee Gen'l Const. Co.....	Cut., fig., brick gutter, bitum. concrete, Alley between Rogers and Burnham Sts., and 25th and 26th Aves., 11th Ward.....	2,454.00
222	July 19, 1917.....	Manger & McGucken Const. Co....	Cut., fig., brick paving on Alley betw. Oregon, Florida, Clinton and Barclay Sts., 5th Ward.....	1,899.20
223	July 17, 1917.....	Manger & McGucken Const. Co....	Excavation, hard sandstone, south half of Washington St., under Subway of C. & N. W. and C. M. & St. P. R. R.....	1,307.40
245	Aug. 18, 1917.....	John Weiher	Cut. br. gutter, bit. concrete paving, So. Alley running E. and W. betw. Cold Spring Ave., Vliet and 12th Sts., and Sheridan Lane	584.40
246	Aug. 17, 1917.....	S. P. Croft.....	Filling, Cherry St., from W. L. of 54th St. to E'ly L. of Hawley Road	4,087.65
247	Aug. 18, 1917.....	Badger Construction Co.....	Cut. fig., asphalt, cement curb and gutter, sidewalks, 53rd St., from N. L. of Enterprise Land Co. Subd. No. 1 to S. L. of Pabst Ave.	6,999.18

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
248	Aug. 18, 1917.....	Badger Construction Co.....	Cut., asphalt, brick gutter, curb reset, new curb, Van Buren St., from N. L. of Wisconsin to S. L. of Mason St.....	4,517.70
249	Aug. 18, 1917.....	Badger Construction Co.....	Cut., asphalt, brick gutter, new curb, reset, Marshall St., from N. L. of Juneau Ave. to S. L. of Ogden Ave.....	8,113.31
250	Aug. 18, 1917.....	Badger Construction Co.....	Cut., asphalt, brick gutter, new curb, reset, Cass St., from N. L. of Juneau Ave. to S. L. of Knapp St.....	4,045.71
251	Aug. 18, 1917.....	F. P. Caughlin Co.....	Cut., asphalt, brick gutter, new curb, reset, Astor St., from N. L. of Juneau Ave. to S. L. of Ogden Ave.....	8,262.48
270	Sept. 24, 1917.....	White Construction Co.....	Cut., asphalt, cement curb and gutter, on Manitoba St., from W. L. of 2nd Ave. to E. L. of 8th Ave.....	18,030.50
271	Sept. 24, 1917.....	White Construction Co.....	Cut., fig., old stone rem., brick gut., asphalt paving, Alley betw. Scott and Washington and 11th and 12th Aves.....	2,018.50
274	Sept. 24, 1917.....	Wisconsin Construction Co.....	Cut., brick pav., bitumin. concrete, Alley betw. Oakland and Farwell Aves., and Irving Pl. and La Fayette Pl. (N. and S. Alley)	918.60
275	Sept. 25, 1917.....	Wisconsin Construction Co.....	Cut. bri. gutter paving, bitum. concrete pavg., Alley betw. Royal Pl., Brady St., Farwell and Prospect Aves.....	1,367.00
276	Sept. 25, 1917.....	Wisconsin Construction Co.....	Cut., brick gutter pavg., bitum. concrete pavg., Alley betw. Farwell, Oakland, La Fayette Pl. and Windsor Pl., 1st Ward.....	987.30

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
277	Sept. 25, 1917.....	Wisconsin Construction Co.....	Cut., brick gutter paving, bitum. concrete paving, Alley betw. Farwell, Oakland, Irving Pl. and Kane Pl.....	1,150.50
278	Sept. 24, 1917.....	Badger Construction Co.....	Cut., asphalt pav., brick gutter, new straight limestone curb, old radius limestone curb reset, Garfield Ave., from W. L. of 3rd St. to E. L. of 4th St.....	3,480.65
279	Sept. 24, 1917.....	Badger Construction Co.....	Cut., old pavement removed, brick gutter, asphalt, Alley betw. 3rd, 4th, Harmon & Lloyd Sts., 6th Ward.....	2,705.95
280	Sept. 24, 1917.....	Badger Construction Co.....	Old pavement removed, asphalt paving, North Ave., from W. L. of West 24th St. to W. L. of 27th St.....	5,766.00
281	Sept. 24, 1917.....	Badger Construction Co.....	Cut., asphalt, brick gutter, new straight limestone curb, old straight limestone curb reset, Biddle St., from E. L. of Van Buren St. to W. L. of Cass Street.....	2,868.60
282	Sept. 24, 1917.....	Badger Construction Co.....	Cut., fig., asphalt, cem. curb and gutter, cem. sidewalks, 53rd St., from N. L. of Pabst Ave. to S. L. of Elm St., and from N. L. of Elm. St. to S. L. of North Ave.....	15,239.01
299	Oct. 5, 1917.....	Milwaukee General Const. Co.....	Cement sidewalks, Orchard St., from 31st Ave. to Trowbridge Ave.	850.00
300	Oct. 8, 1917.....	John Weiher	Cut., brick gutter, bitum. concrete, Alley betw. Bartlett, Oakland, Kane Pl. and Irving Pl.....	1,287.00
301	Oct. 8, 1917.....	John Weiher	Cut., brick gutter, bitum. concrete, Alley betw. Bartlett Ave., Windsor Pl., Newhall St. and Cambridge Ave.....	1,599.70

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
302	Oct. 10, 1917.....	Dean Construction Co.....	Cement sidewalks, 21st St., from Keefe Ave. to about 300 feet north	700.00
				525.00
304	Nov. 13, 1917.....	Meyer Construction Co.....	Necessary filling and construction work at No. 51-65 Erie St.....	
85	Mar. 29, 1917.....	George E. Zimmermann.....	Sewer in Locust St., from 7th St. to 9th St., and in 9th St., from Locust to Burleigh St.....	20,620.32
108	Apr. 24, 1917.....	Geo. L. O'Donnell.....	Pipe sewer in Orchard Pl., from 28th Ave. to 170 feet E. of 28th Ave., and in Orchard Pl., from 29th Ave. to 170 feet E. of 29th Ave., and in Orchard Pl. from 30th Ave. to 135 feet E. of 30th Ave.	2,239.25
				955.35
109	Apr. 24, 1917.....	W. T. Werner.....	Sewer in 46th St., from Center to Clarke St.....	1,949.30
110	Apr. 24, 1917.....	W. T. Werner.....	Sewer in Herbert St., from 22nd to 24th St.....	1,095.60
111	Apr. 24, 1917.....	W. T. Werner.....	Sewer in 37th St., from Chambers to Locust St.....	
112	Apr. 24, 1917.....	W. T. Werner.....	Sewer in Edgewater Ave., from Humboldt Ave. to Milwaukee River	1,075.14
				3,655.05
113	Apr. 24, 1917.....	W. T. Werner.....	Relief sewer in Hartford Ave., from Downer to Marietta Ave.....	
114	Apr. 24, 1917.....	W. T. Werner.....	Sewer in 43rd St. (Sherman Blvd.), from Burleigh St. to Chambers St.	877.02
				553.85
115	Apr. 24, 1917.....	W. T. Werner.....	Sewer in 13th Ave., from Arthur Ave. to Windlake Ave.....	2,004.48
116	Apr. 24, 1917.....	Jos. B. Forrestal Co.....	Sewer in Clybourn St., from 22nd to 25th St.....	
117	Apr. 24, 1917.....	Jos. B. Forrestal Co.....	Sewer in 12th Ave., from National Ave. to 420 feet south of National Ave.	1,192.38

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
118	Apr. 24, 1917.....	M. Synovitz	Sewer in 9th Ave., from Right-of-Way of C. & N. W. Ry. to Dakota Street, and in 10th Ave., from R. O. W. of C. & N. W. Ry. to Dakota St., and in American Ave., from R. O. W. of C. & N. W. Ry. to Dakota St.....	5,649.25
151	May 18, 1917.....	George E. Zimmermann.....	Sewer in 8th St., from Lake St. to 162 feet south of Mills St....	2,331.42
152	May 18, 1917.....	George E. Zimmermann.....	Sewer in 9th St., from Green Bay Ave. to Graham St.....	3,941.07
153	May 18, 1917.....	George E. Zimmermann.....	Sewer in Graham St., from 8th St. to 103 feet west of 10th St....	1,781.78
154	May 18, 1917.....	W. T. Werner.....	Concrete and pipe sewer in Humboldt Ave., from Lake St. to Keefe Ave.	18,354.60
155	May 18, 1917.....	M. Synovitz	Sewer in American Ave., from Dakota St. to Manitoba St.....	2,296.37
165	May 31, 1917.....	George E. Zimmermann.....	Reconstruction of sewer in 15th St., from North Canal St. to Menomonee Canal	15,485.00
229	Aug. 10, 1917.....	Herman Hohensee	Sewer in Spring Ave., from Vliet to North Ave., and in Pabst Ave. from Spring St. to 57th St., and in 57th St. from Pabst to North Ave.....	51,885.98
230	Aug. 10, 1917.....	George E. Zimmermann.....	Sewer in Hartford Ave., from Oakland to a point 660 feet east of Maryland Ave.	1,327.84
231	Aug. 10, 1917.....	George E. Zimmermann.....	Sewer in Grant St., from 26th Ave. to 27th Ave.....	743.29
232	Aug. 10, 1917.....	George E. Zimmermann.....	Sewer in Manitoba St., from 7th Ave. to 9th Ave.....	1,150.68
233	Aug. 10, 1917.....	George E. Zimmermann.....	Sewer in Fratney St., from Franklin to Becker St.....	1,070.91

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
234	Aug. 10, 1917.....	W. T. Werner.....	Sewer in Green Bay Ave., from 9th St. to City Limits; and in Lake St., from 9th St. to Green Bay Ave.....	2,659.20
			Sewer in Chambers St., from 37th to 38th St.....	510.27
235	Aug. 10, 1917.....	Herman Hohensee	Concrete sewer in Delaware Ave.....	29,767.00
264	Aug. 10, 1917.....	George E. Zimmermann.....	Lake St. Sewer Extension, between Green Bay Ave. and West Line of West 19th St.....	100,113.00
273	Sept. 29, 1917.....	Wisconsin Tunnel & Const. Co....	Sewer in Port Washington Road, from Lake St. to Keefe Ave....	8,992.50
269	Sept. 29, 1917.....	W. T. Werner.....	Mason work, 5th Avenue Natatorium.....	13,188.00
40	Mar. 7, 1917.....	Arthur W. Riesen.....	Concrete work, 5th Avenue Natatorium.....	9,565.00
41	Mar. 7, 1917.....	F. W. Taddey.....	Lathing and plastering work, 5th Ave. Natatorium.....	465.00
42	Mar. 7, 1917.....	H. J. Krauss & Son.....	Cut stone work, 5th Ave. Natatorium.....	3,984.00
43	Mar. 7, 1917.....	John Hauert	Carpenter work, 5th Ave. Natatorium.....	4,144.00
45	Mar. 7, 1917.....	Jacob Koenen	Galvanized iron and tin work, 5th Avenue Natatorium.....	3,700.00
46	Mar. 7, 1917.....	Frank J. Romberger.....	Painting and glazing work, 5th Ave. Natatorium.....	798.00
47	Mar. 7, 1917.....	P. Oscar Olsen.....	Plumbing, gas fitting and sewerage work, 5th Ave. Natatorium...	9,560.00
48	Mar. 7, 1917.....	Jos. Brah	Tile work, 5th Ave. Natatorium.....	1,436.00
49	Mar. 7, 1917.....	Jos. R. Devitt.....	Install refrigerator apparatus, dining hall, Blue Mound Sanatorium	3,750.00
27	Feb. 21, 1917.....	H. W. Johns-Manville Co.....	Erect latticed railings in subways under C. M. & St. P. and C. & N. W. Ry Tracks at National Ave., Greenfield Ave., and Washington St.	1,577.25
93	Apr. 12, 1917.....	C. Hennecke Co.....		

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
126	May 2, 1917.....	Berger Mfg. Co.....	Install metal lockers for McKinley and South Shore Houses.....	4,498.00
163	May 24, 1917.....	Gustave Frey & Co.....	Mason work, North Point Pumping Station Add.....	520.00
194	June 13, 1917.....	Paul L. Biersach.....	Galvanized iron and tin work, Blue Mound Sanatorium.....	540.00
195	June 13, 1917.....	C. Hennecke Company.....	Cast iron and steel work, Blue Mound Sanatorium.....	1,253.00
196	June 13, 1917.....	P. A. Johnson.....	Painting and glazing work, Blue Mound Sanatorium.....	164.00
197	June 13, 1917.....	Wenzel & Henoch Co.....	Heating work, Blue Mound Sanatorium.....	10,540.00
198	June 13, 1917.....	C. W. Tingley.....	Cut stone work, Blue Mound Sanatorium.....	400.00
199	June 13, 1917.....	C. J. Fox.....	Plumbing work, Blue Mound Sanatorium.....	858.00
200	June 13, 1917.....	Chas. Guetzkow	Carpenter work, Blue Mound Sanatorium.....	385.00
201	June 13, 1917.....	John Schmitz, Jr.....	Mason work, Blue Mound Sanatorium.....	3,920.00
202	June 13, 1917.....	John Schmitz, Jr.....	Concrete and cement work, Blue Mound Sanatorium.....	4,110.00
215	June 22, 1917.....	C. Hennecke Co.....	Structural steel and iron work, 5th Ave. Natatorium.....	7,286.00
218	July 5, 1917.....	C. Hennecke Co.....	Erect railings at subways under C. M. & St. P. R. R. Tracks at Reed and Lake Sts.....	1,316.00
237	Aug. 14, 1917.....	Great Lakes Dredge & Dock Co...	Construct a new protection pier at Pleasant St. Bridge.....	7,248.00
238	Aug. 14, 1917.....	Schmitt & Tim.....	Mason work for locker building at Erie St.....	720.00
239	Aug. 14, 1917.....	O. H. Bossert Co.....	Concrete and excavating work for locker building, foot of Erie St.	360.00
240	Aug. 14, 1917.....	C. W. Tingley.....	Cut stone work for locker building, foot of Erie St.....	185.00
241	Aug. 14, 1917.....	Alfred Teetzen	Carpenter work for locker building, foot of Erie St.....	370.00

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
242	Aug. 14, 1917.....	Wenzel & Henoch Co.....	Plumbing, sewerage and steam fitting work for locker building, foot of Erie St.....	1,215.00
243	Aug. 14, 1917.....	P. A. Johnson.....	Painting and glazing work for locker building, foot of Erie St..	79.00
244	Aug. 14, 1917.....	Federal Steel Fixture Co.....	All lockers for locker building, foot of Erie St.....	345.20
252	Aug. 31, 1917.....	Walter Bucholtz	Mason work, Police Sta., 12th and Sherman Sts.....	6,803.00
253	Aug. 31, 1917.....	Wm. Lietz	Concrete and cement work, Police Station, 12th and Sherman Sts.	11,190.00
254	Aug. 31, 1917.....	C. W. Tingley.....	Cut stone work, Police Station, 12th and Sherman Sts.....	1,145.00
255	Aug. 31, 1917.....	C. Hennecke Co.....	Cast iron and steel work, Police Station, 12th and Sherman Sts...	1,346.00
256	Aug. 31, 1917.....	G. F. M. Witte.....	Carpenter work, Police Station, 12th and Sherman Sts.....	4,448.00
257	Aug. 31, 1917.....	Alex G. Goethel Sheet M. Wks. Co.	Galvanized iron and tin work, Police Station, 12th and Sherman Sts.	1,240.00
258	Aug. 31, 1917.....	Paul Wagner & Co.....	Painting and glazing, Police Station, 12th and Sherman Sts.....	972.00
259	Aug. 31, 1917.....	Jos. Brah	Plumbing and sewerage work, Police Station, 12th and Sherman Sts.	3,390.00
260	Aug. 31, 1917.....	Wenzel & Henoch Co.....	Heating work, Police Station, 12th and Sherman Sts.....	2,760.00
261	Aug. 31, 1917.....	A. H. Bleuel.....	Lath and plastering work, Police Station, 12th and Sherman Sts.	700.00
262	Aug. 31, 1917.....	C. Hennecke Company.....	Steel cells, Police Station, 12th and Sherman Sts.....	1,246.00
265	Sept. 24, 1917.....	Emil Grether	Mason work, Storehouse Bldg., 1st Ave. and East St.....	785.00
266	Sept. 24, 1917.....	Milwaukee Gen'l Const. Co.....	Concrete and excavating work, Storehouse Bldg., 1st Ave. and East St.	1,932.00
267	Sept. 24, 1917.....	Wm. Hackendahl	Cast iron and steel work, Storehouse Bldg., 1st Ave. and East St..	268.00

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
268	Sept. 22, 1917.....	Great Lakes Dredge & Dock Co...	Piling and concrete work for reinforced concrete retaining wall at Muskego Ave. Bascule Bridge.....	7,238.00
285	Oct. 2, 1917.....	A. F. Wagner Arch. Iron Works..	Cast and wrought iron work, Administration Bldg., on Mitchell St.	4,694.00
286	Oct. 2, 1917.....	Wm. F. Erdmann.....	Cut stone work, Administration Bldg., on Mitchell St.....	780.00
287	Oct. 2, 1917.....	S. V. Hanley.....	Plumbing, sewerage and gas fitting for Administration Bldg., on Mitchell St.	3,489.00
288	Oct. 2, 1917.....	Wierdsma & Laatsch.....	Carpenter work, Administration Bldg., on Mitchell St.....	3,375.00
289	Oct. 2, 1917.....	Louis Hoffmann	Galvanized iron and tin work, Administration Bldg., on Mitchell St.	1,084.00
290	Oct. 2, 1917.....	Frank Spetz	Painting and glazing work, Administration Bldg., on Mitchell St.	1,074.00
291	Oct. 2, 1917.....	American Monolith Company.....	Composition floors, Administration Bldg., on Mitchell St.....	2,000.00
292	Oct. 2, 1917.....	Wenzel & Henoch Co.....	Heating and ventilating work, Administration Bldg., on Mitchell St.	2,120.00
293	Oct. 2, 1917.....	Philip Gross Hardware Co.....	Hardware, Administration Bldg., on Mitchell St.....	896.00
294	Oct. 2, 1917.....	Bandtel Construction Co.....	Mason work, Administration Bldg., on Mitchell St.....	5,982.00
295	Oct. 2, 1917.....	Kroening Const. Co.....	Concrete and cement work, Administration Bldg., on Mitchell St..	7,990.00
296	Oct. 2, 1917.....	F. W. Baumann.....	Lath and plastering work, Administration Bldg., on Mitchell St..	3,278.00
297	Oct. 6, 1917.....	O. H. Bossert Co.....	Concrete and excavation work, concrete stairway, 35th St. south of Clifton Ave., Wauwatosa, Wisconsin.....	1,450.00

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

No. Cont.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
298	Oct. 6, 1917.....	C. Hennecke Company.....	Gas pipe railing, concrete stairway, 35th St. south of Clifton Ave., Wauwatosa, Wis.	382.00
303	Oct. 12, 1917.....	Bandtel Construction Company....	Concrete protection railing, La Fayette Pl. Bridge.....	671.00
305	Nov. 10, 1917.....	George E. Zimmermann.....	Laying water main from hydrant at Insane Asylum to premises located on Blue Mound Road.....	2,380.48
307	Dec. 14, 1917.....	Milwaukee Struc. Steel Co.....	Floor system, Cherry Street Bridge.....	3,740.00
1	Jan. 15, 1917.....	Arnold Hoffmann & Co., Inc.....	50,000 lbs. liquid chlorine.....	6,750.00
3	Jan. 22, 1917.....	H. Mueller Mfg. Co.....	Corporation cocks	1,968.00
4	Jan. 23, 1917.....	H. Mueller Mfg. Co.....	Curb cocks	2,064.50
7	Jan. 25, 1917.....	A. M. Johnson.....	Refreshment stand at McKinley Beach.....	250.00
9	Jan. 31, 1917.....	Chapman Valve Mfg. Co.....	Furnish tapping valves.....	10,345.00
10	Jan. 31, 1917.....	B. Hoffmann Mfg. Co.....	Furnish gate valves.....	725.00
51	Mar. 12, 1917.....	The Glauber Brass Mfg. Co.....	Furnish meter couplings.....	3,029.00
65	Mar. 26, 1917.....	Kinsella Transfer Co.....	Hauling water pipe hydrants and special castings for Water Department	2,117.50
66	Mar. 26, 1917.....	Edw. O'Donnell	Laying water mains.....	30,492.00
78	Apr. 4, 1917.....	Downey Heating & Supply Co.....	300 H. P. tube boilers for south end of boiler house at North Point Pumping Station.....	23,677.00
88	Apr. 9, 1917.....	Seeboth Bros. Co.....	Purchase scrap iron and brass from Water Department.....	200.00
90	Apr. 11, 1917.....	Cannon Printing Co.....	Annual Report for Water Department.....	331.20
94	Apr. 14, 1917.....	Milwaukee Western Fuel Co.....	3,000 tons Youghiogheny screenings, North Point Pumping Sta..	20,250.00

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
142	May 15, 1917	Hammond-Byrd Iron Co	25 tons special castings, Water Department	2,388.25
143	May 15, 1917	Hammond-Byrd Iron Co	125 tons "C" water pipe	12,494.25
146	May 15, 1917	Windsor Mfg. Company	Soft Omaha lead for Water Department	2,200.00
163	May 24, 1917	Gustave Frey & Company	Mason work, North Point Pumping Station Addition	520.00
164	May 24, 1917	A. G. Modler	Carpenter work, North Point Pumping Station Addition	314.00
180	June 11, 1917	Allis-Chalmers Co.	12,000,000 gal. pumping engine, North Point Pumping Station	175,000.00
224	July 24, 1917	Frank Wabiszewski	Material and work for extension to tower at High Service Sta., North Ave., bet. 10th and 11th Sts	5,462.00
283	Oct. 3, 1917	Seeboth Bros. Co	Purchase scrap iron, brass from Water Department	500.00
284	Oct. 3, 1917	Martin Zwoster	Purchase all brass borings from Water Department	100.00
50	Mar. 9, 1917	Wenzel & Henoch Co	Install steam heating boiler in Truck House No. 7	372.00
87	Apr. 5, 1917	The Seagrave Company	3 automobile ladder trucks	19,500.00
119	Apr. 21, 1917	Wenzel & Henoch Co	Install steam heating boiler, Engine Co. No. 4, and Repair Shop	694.00
145	May 16, 1917	Jos. B. Forrestal Co	Lay water pipe for Fire Dept., extending from present pipe line on 15th St. to North Canal St., to 16th St., to dock line of North Menomonee Canal	600.00
226	July 26, 1917	McCoy-Nolan Co.	5,000 lin. feet 2½ inch double jacket fire hose	4,380.00
227	July 26, 1917	McCoy-Nolan Co.	1,000 lin. feet 3½ inch double jacket fire hose	1,320.00
57	Mar. 14, 1917	The Barrett Company	200,000 gallons bituminous road binder	17,000.00
58	Mar. 14, 1917	The Barrett Company	100,000 gallons bituminous road surfacing material	8,500.00
61	Mar. 14, 1917	Standard Oil Company	50,000 gallons No. 1 road oil	2,670.00

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
62	Mar. 14, 1917.....	Barber Asphalt Paving Company..	200,000 gallons No. 2 road oil.....	7,000.00
63	Mar. 14, 1917.....	The Barrett Company.....	50,000 gallons No. 3 road oil.....	3,125.00
139	May 8, 1917.....	The Thomas Furnace Company...	3,000 cu. yds. granulated slag.....	3,000.00
64	Mar. 19, 1917.....	Wisconsin Dredge & Dock Co.....	Dredging the several rivers and canals.....	25,000.00
67	Mar. 28, 1917.....	Arthur H. Vogel (assigned to Great Lakes Dredge & Dock Co.)	Stone breakwater in Milwaukee Harbor, from Wisconsin St. to Milwaukee River	173,000.00
2	Jan. 10, 1917.....	Aug. Holstein	Build election booths (3).....	678.00
5	Jan. 9, 1917.....	Welsbach Str. Lighting Co. of Wis.	Lighting street lamps, gasoline.....	10,746.45
30	Feb. 26, 1917.....	Drave Company	Superheaters for Kinnickinnic River Station.....	485.00
79	Apr. 3, 1917....	T. G. Holton.....	House drains and water connections in Cedar St., from 16th to 24th Sts.	178.00
80	Apr. 3, 1917.....	W. T. Werner.....	House drains and water connections in Concordia Ave., from 27th to 30th St.....	571.20
81	Apr. 3, 1917.....	W. T. Werner.....	House drains and water connections in 3rd St., from Keefe Ave. to 612 feet north.....	955.50
82	Apr. 3, 1917.....	W. T. Werner.....	House drains and water connections in 51st St., from Elm St. to North Ave.....	461.20
83	Apr. 3, 1917.....	W. T. Werner.....	House drains and water connections in Arthur Ave., from 13th Ave. to 14th Ave.....	133.50

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
84	Apr. 3, 1917.....	W. T. Werner.....	House drains and water connections in Groeling Ave., from Louis Ave. to Teutonia.....	276.20
86	Mar. 30, 1917.....	T. M. Gray, Jr.....	Making test borings for Spring Ave., Dakota St. and Lake St. sewer tunnels	2,740.00
89	Apr. 9, 1917.....	Arthur Kehrein	House drains and water connections in Sherman Boulevard, from Wright St. to Center St.....	456.00
92	Apr. 18, 1917.....	Dean Construction Company.....	Install gas street lighting units.....	39,800.00
107	Apr. 20, 1917.....	Broadway Press	250 copies of Annual Report of the Department of Public Works	620.50
128	May 2, 1917.....	George E. Zimmermann.....	House drains and water connections in Van Buren St., from Martin to Oneida St.....	119.20
129	May 2, 1917.....	Arthur Kehrein	House drains and water connections in 54th St., from Vine St. to North Ave.	3,097.00
130	May 2, 1917.....	George E. Zimmermann.....	House drains and water connections in 11th Ave., from Forest Home Ave. to Windlake Ave.....	406.00
132	May 2, 1917.....	George E. Zimmermann.....	House drains and water connections in Windlake Ave., from Lincoln Ave. to 13th Ave.....	512.00
133	May 2, 1917.....	George E. Zimmermann.....	House drains and water connections in 22nd St., from Sycamore to Clybourn St.....	108.00
134	May 2, 1917.....	George E. Zimmermann.....	House drains and water connections in Cedar St., from 27th St. to 35th St.....	415.40

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
135	May 2, 1917.....	W. T. Werner.....	House drains and water connections in Washington Blvd., from 47th St. to the West City Limits.....	2,139.00
140	May 11, 1917.....	F. A. Goll.....	House drains and water connections in Garden St., from Harrison to Chicago Aves.....	589.20
141	May 8, 1917.....	F. A. Goll.....	House drains and water connections in 13th Ave., from Windlake Ave. to Arthur Ave.....	119.60
144	May 15, 1917.....	W. T. Werner.....	House drains and water connections in Clybourn St., from 20th to 25th Sts.	2,260.30
171	June 2, 1917.....	F. A. Goll.....	House drains and water connections in Midland Ave., from 270 feet North of Dakota St. to Oklahoma Ave.....	3,654.10
172	June 2, 1917.....	F. A. Goll.....	House drains and water connections in 9th Ave., from Dakota St. to Oklahoma Ave.....	3,001.60
173	June 2, 1917.....	W. T. Werner.....	House drains and water connections in 8th St., from Graham St. to Green Bay Ave.....	1,938.70
174	June 2, 1917.....	W. T. Werner.....	House drains and water connections in 15th St., from Finn Pl. to Nash St.	1,288.25
181	June 7, 1917.....	Arthur Kehrein	House drains and water connections in 5th Ave., from Montana St. to Oklahoma Ave.....	1,893.00
182	June 7, 1917.....	Arthur Kerhein	House drains and water connections in Cramer St., from Kenwood Blvd. to Edgewood Ave.....	4,982.00

LIST OF CONTRACTS AWARDED DURING 1917—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
183	June 7, 1917.....	F. A. Goll.....	House drains and water connections in 9th St., from Graham St. to North Line of Somer's Subdivision No. 1.....	2,232.50
184	June 11, 1917.....	George E. Zimmermann.....	House drains and water connections in Green Bay Ave., from Atkinson Ave. to Graham St., and in 7th St., from Green Bay Ave. south	1,942.20
185	June 7, 1917.....	F. A. Goll.....	House drains and water connections in 24th Ave., from Mitchell St. to Burnham St.....	196.80
186	June 7, 1917.....	Arthur Kehrein	House drains and water connections in 2nd Ave., from Dakota St. to Oklahoma Ave.....	2,766.00
187	June 7, 1917.....	Arthur Kehrein	House drains and water connections in 3rd Ave., from Montana St. to Oklahoma Ave.....	2,906.00
188	June 7, 1917.....	Arthur Kehrein	House drains and water connections in 10th Ave., from Dakota St. to Oklahoma Ave.....	2,558.00
189	June 7, 1917.....	Arthur Kehrein	House drains and water connections in 7th Ave., from Montana St. to Oklahoma Ave.....	3,927.00
190	June 7, 1917.....	Arthur Kehrein	House drains and water connections in 6th Ave., from Montana St. to Oklahoma Ave.....	2,832.00
191	June 7, 1917.....	Arthur Kehrein	House drains and water connections in 4th Ave., from Montana St. to Oklahoma Ave.....	3,047.00
192	June 7, 1917.....	F. A. Goll.....	House drains and water connections in 17th St., from Finn Pl. to Nash St.	1,021.60

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
193	June 7, 1917.....	F. A. Goll.....	House drains and water connections in Graham St., from Atkinson Ave. to Green Bay Ave.....	1,281.00
216	June 26, 1917.....	George E. Zimmermann.....	House drains and water connections in Richards St., from Keefe Ave. to Franklin St.....	2,548.00
219	July 17, 1917.....	T. G. Holton.....	House drains in Farwell Ave., and North Ave.....	277.00
225	July 25, 1917.....	F. A. Goll.....	House drains and water connections in 16th St., from Cedar to to Vliet St.	55.50
228	Aug. 7, 1917.....	W. T. Werner.....	House drains and water connections in 53rd St., from N. L. of Enterprising Land Co.'s Sub. No. 1 to Pabst Ave.....	1,052.80
263	Sept. 14, 1917.....	George E. Zimmermann.....	House drains and water connections in 53rd St., from Pabst Ave. to North Ave.	1,937.80
306	Dec. 7, 1917.....	Henry Knaack	Test borings in Linwood Ave., betw. Lake Michigan and Milwaukee River	1,986.75
308	Dec. 20, 1917.....	The Philip Schwab Co.....	Repairs to asphalt plant.....	750.00

January 1, 1918

List of Permanent Pavements Upon Which the Guarantee Period Commences in 1917

STREETS UNDER GUARANTEE.

An additional list of streets and alleys having permanent pavements, the guarantee period of same commencing during the year 1917, as follows:

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Dean Const. Co	Alley in Blk. 42, bet. 3rd, 4th, Chestnut and Prairie, 2nd Ward			5	Brick	May 5, 1922
Manger Const. Co	S. Alley running E. and W., Blk. 119, bet. 8th, 9th, Vliet and Winnebago Sts., 2nd Ward			5	Brick	May 4, 1922
Badger Const. Co	Alley, Blk. 3, Johnston & Pierce's Subd., betw. 8th, 9th, Locust and Chambers Sts., 25th Ward			1	Bit. Con.	May 18, 1918
Badger Const. Co	Alley Blk. 2, Johnston & Pierce's Subd., betw. 8th, 9th, Chambers and Burleigh Sts., 2nd Ward			1	Bit. Con.	May 18, 1918
Badger Const. Co	Alleys running E. & W. Blk. 99, bet. 8th, 9th, Walnut and Galena Sts., 6th Ward			1	Bit. Con.	May 19, 1918
Badger Const. Co	Alley Blk. 15, Milk. Savg. & Inv. Assn. Sub. No. 2, bet. Burleigh, Ring, 10th and 11th Sts., 25th Ward			1	Bit. Con.	May 19, 1918
Fred Hildebrand, Jr.	Alley Blk. 6 and Blk. 42, bet. 4th, 5th, Sherman and Walnut, 6th Ward			5	Brick	May 15, 1922
Milwaukee Gen'l Const. Co	Alley Blk. 4, Weil, Wechselberg & Cramer's Add., etc., bet. 7th, 8th, Lincoln and Hayes Avenues, 14th Ward			1	Bit. Con.	May 31, 1918
Milwaukee Gen'l Const. Co	Alley Blk 1, Weil, Wechselberg & Cramer's Addn., betw. Midland, 5th, Lincoln and Hayes Avenues, 14th Ward			1	Bit. Con.	May 31, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Wisconsin Const. Co	Alley Blk. 5, Cont. of Riverside Park Subd., and Blk. 5, Riverside Park Subd., betw. Bartlett, Newhall, Park, and Riverside Place, 18th Ward			1	Bit. Con.	June 13, 1918
Wisconsin Const. Co	Alleys Blk. 1, F. Gehrke's Realty & Inv. Co.'s Subd., and Blk. 1, Riverside Hts., bet. Linwood, Kenwood, Oakland and Bartlett, 18th Ward			1	Bit. Con.	June 12, 1918
Paul C. Kroeck	Alleys, Blk. 1, Volkmann's Subd., Blk. 4, Jacob Truss' Subd. and Lands in the S. E. ¼ of S. E. ¼ Sec. 8, betw. Island Ave., Richards St., Burleigh and Ring Sts., 21st Ward			1	Bit. Con.	June 16, 1918
Badger Const. Co	Alley Blk 1, First Cont. of Boulevard Park, betw. 41st St., Grant Blvd., Meinecke Ave. and Wright St., 22nd Ward			1	Bit. Con.	June 1, 1918
Badger Const. Co	Alley Blk. 2, Jackson Park, Blk. 2, U. S. Inv. Assn. Sub. No. 3, Lands, and Blk. 2, Markham's Add., betw. 44th, 45th, Wright Sts. and Meinecke Ave., 22nd Ward			1	Bit. Con.	June 1, 1918
Badger Const. Co	Alley Blk. 8, Mann, Burke & Somers' Subd., and Blk. 9, Fritze's Subd., betw. 20th, 21st, Wright and Clarke Sts., 7th Ward			1	Bit. Con.	June 1, 1918
Fred Hildebrand, Jr	E. and W. Alley Blk. 213, Central Park Sub., bet. 14th, 15th, Prairie and State Sts., 2nd Ward			5	Brick	May 25, 1922
John Weiher	Alley Blk. 5, Public Park Land Assn. Subd., bet. 44th, 45th Sts., Pabst and Lisbon Aves., 22nd Ward			1	Bit. Con.	June 5, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET FROM TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Wisconsin Const. Co.....	N. Alley running E. & W. in Blk. 1, Luedke's Subd., Blk. 1, H. Holle's Sub., F. Holle's Subd. and Blk. 3, Vogt's Sub., bet. 9th, 10th, Center and Hadley Sts., 25th Ward.....	1	Bit. Con.	June 22, 1918
John Weiher	Alley Blk. 1, Jackson Park, Blk. 2, U. S. Inv. Assn. Sub. No. 3, etc., between Sherman Blvd., 44th St., Wright St. and Meinecke Ave., in the 22nd Ward.....	1	Bit. Con.	June 15, 1918
John Weiher	Alley Blk. 10, 2nd Cont. of Boulevard Park, bet. 40th, 41st, Wright and Clarke Sts., 22nd Ward.....	1	Bit. Con.	June 18, 1918
John Weiher	Alley Blk. 5, 1st Cont. of Boulevard Park, bet. Grant and Sherman Blvds., and Wright St. and Meinecke Ave., 22nd Ward.....	1	Bit. Con.	June 18, 1918
John Weiher	Alley Blk. 6, Public Park Land Assn., bet. 45th, 46th Sts., Pabst Ave. and Elm St., 22nd Ward.....	1	Bit. Con.	June 6, 1918
John Weiher	Alley Blk. 7, 1st Cont. of Blvd. Park, bet. 40th, 41st, Wright Sts. and Meinecke Ave., 22nd Ward.....	1	Bit. Con.	June 19, 1918
John Weiher	Alley Blk. 11, 2nd Cont. of Blvd. Park, bet. 41st St., Grant Blvd., Wright and Clarke Sts., 22nd Ward.....	1	Bit. Con.	June 19, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
John Weiher	Alley in Blk. 1, Resubd. of Lots 1 to 7 inclusive, Lots 9 to 27 incl., of Blks. 236, 237 and 242, Lots 1 to 6 incl., Lots 19 to 24 incl., of Blk. 243, and Lots 18 to 22 incl. of Blk. 242, Dahlman and Killian Subd., bet. Tamarack and 27th Sts., Fond du Lac and Kilbourn Aves., in the 22nd Ward			1	Bit. Con.	July 3, 1918
John Weiher	Alley Blk. 2, Resubd. of Lots 1 to 7 incl., Lots 9 to 27 incl., of Blk. 236, 237 and 242, Dahlman & Killian's Subd., bet. 26th, 27th, Wright Sts. and Kilbourn Ave., 22nd Ward			1	Bit. Con.	July 5, 1918
Retzlaff & Froemming	Alley Blk. 1, Florence Inv. Co.'s Sub. No. 1, and Blk. 3, Badger State Park, bet. 20th, 21st Chambers and Burleigh Sts., in the 20th Ward			1	Bit. Con.	July 2, 1918
Retzlaff & Froemming	Alley Blk. 3, Florence Inv. Co.'s Sub. No. 1, and Blk. 3, Badger State Park, bet. 22nd, 23rd, Chambers and Burleigh Sts., in the 20th Ward			1	Bit. Con.	July 3, 1918
John Weiher	Alley Blk. 9, 2nd Cont. of Blvd. Park, bet. 39th, 40th, Wright and Clarke Sts., 22nd Ward			1	Bit. Con.	June 15, 1918
Paul C. Kroeck	Alley Blk. 1, Plankinton's Add., Blk. 1, Lambrecht's Subd. and Asst. Sub. No. 10, bet. 16th, 17th, Vine and Walnut Sts., in the 9th Ward			1	Bit. Con.	July 5, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Paul C. Kroeck	Alley Blk. 218, Eldred's Add., bet. 15th, 16th, Cedar and Wells Sts., in the 4th Ward			1	Bit. Con.	July 9, 1918
Paul C. Kroeck	Alley Blk. 2, Logan Park, bet. 36th, 37th, Elm Sts., and North Ave., in the 22nd Ward			1	Bit. Con.	July 21, 1918
John Weiher	Alley Blk. 3, Logan Park, bet. 37th, 38th, Elm sts. and North Ave., 22nd Ward			1	Bit. Con.	July 26, 1918
Paul C. Kroeck	Alley Blk. 4, National Park Subd., bet. 25th, 26th Aves., National Ave. and Scott St., 23rd Ward			1	Bit. Con.	Aug. 7, 1918
Fred Hildebrand, Jr.	Alley Blk. 47, bet. 3rd, 4th, Prairie and State, 2nd Ward			5	Brick	July 13, 1922
Manger Const. Co.	So. Alley Blk. 58, bet. Grand Ave., Wells, West Water Sts., and the Milwaukee River, 4th Ward			5	Brick	Aug. 13, 1922
Paul C. Kroeck	Alley Blk. 2, Lademann's Sub., and Blk. 2, Walnut Hill, etc., bet. 33rd, 34th, Walnut Sts. and Lisbon Ave., 19th Ward			1	Bit. Con.	July 19, 1918
Wisconsin Const. Co.	Alley Blk. 15, Rice's Subd., bet. 25th, 26th, Center and Hadley Sts., in the 20th Ward			1	Bit. Con.	Aug. 11, 1918
Paul C. Kroeck	Alley Blk. 14, Cont. of Merrill's Park, bet. 31st, 32nd, Mt. Vernon and Park Hill Ave., 16th Ward			1	Bit. Con.	July 19, 1918
Paul C. Kroeck	Alley Blk. 11, Cont. of Merrill's Park, bet. 33rd, 34th, Clybourn Sts. and St. Paul Ave., 16th Ward			1	Bit. Con.	July 19, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
John Weiher	Alley Blk. 4, Columbia Park, bet. 34th, 35th, Lloyd and Elm Sts., in the 22nd Ward			1	Bit. Con.	Aug. 18, 1918.
John Weiher	Alley Blk. 1, Logan Park, bet. 35th, 36th, Elm Sts. and North Ave., in the 22nd Ward			1	Bit. Con.	Aug. 17, 1918
Milwaukee Gen'l Const. Co.	Alley Blk. 19, Lake Side Park No. 2, bet. Texas, Illinois, Superior Sts. and Wentworth Ave., in the 17th Ward			1	Bit. Con.	July 27, 1918
Wisconsin Const. Co.	Alley Blk. 1, Wellauer's Add. No. 1, Blk. 1, Washington Ave. Addition, bet. 25th, 26th, Hadley and Locust Sts., in the 20th Ward			1	Bit. Con.	July 9, 1918
Paul C. Kroeck	Alley Blk. 5, and Alley Blk. 43, Sherman's Add., bet. 3rd, 4th, Sherman and Walnut Sts., 6th Ward			1	Bit. Con.	June 25, 1918
Paul C. Kroeck	Alley's Blk. 216, Eldred's Add., bet. 15th, 16th, State and Prairie Sts., 2nd Ward			1	Bit. Con.	July 9, 1918
Milwaukee Gen'l Const. Co.	Alley Blk. 2, Weil, Wechselberg & Cramer's Add., etc., bet. 5th, 6th, Lincoln and Hayes Ave., 14th Ward			1	Bit. Con.	Aug. 20, 1918
John Weiher	Alley Blk. 1, Meehan & Somer's Subd., bet. 26th, 27th, Elm Sts. and North Ave., 22nd Ward			1	Bit. Con.	Aug. 22, 1918
Henry Hase	Alley Subd. Blk. 2, of Lots 10 to 19, incl., Dousman's Sub., bet. 29th, 33rd, Chestnut and Highland Blvd., 15th Ward			5	Brick	Sept. 1, 1922
John Weiher	Alley Blk. 2, Meehan & Somer's Sub., bet. 25th, 26th, Elm and North Ave., 22nd Ward			1	Bit. Con.	Aug. 27, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Manger & McGucken Const. Co.	Alley Blk. 34, Walker's Point, bet. Florida, Oregon, Clinton and Barclay Sts., 5th Ward			5	Brick	Aug. 31, 1922
Wisconsin Const. Co.	Alley Blk. 6, Hi Mount, bet. 50th, 51st, Vine Sts. and Washington Blvd., 19th Ward			1	Bit. Con.	Sept. 1, 1918
John Weiher	Alley Blk. 245, Dahlman & Kilian's Sub., bet. West 24th and 25th Sts., North and Meinecke Ave., 22nd Ward			1	Bit. Con.	Oct. 26, 1918
John Weiher	Alley Blk. 4, Prussian Heights, bet. 34th, 35th, Wright and Clarke Sts., 22nd Ward			1	Bit. Con.	Oct. 26, 1918
John Weiher	Alley Blk. 2, Western Ave. Park, bet. 36th, 37th, Clarke and Center Sts., 22nd Ward			1	Bit. Con.	Oct. 26, 1918
Badger Const. Co.	Alley Blk. 22, Sherman's Add., bet. 3rd, 4th, Harmon and Lloyd Sts., 6th Ward			5	Asphalt	Nov. 2, 1922
Wisconsin Const. Co.	Alley running N. and S., Blk. 230, A. L. Kane's Subd., and Blk. 230, Perkin's Subd., of 6 acres, bet. Oakland and Farwell Aves., Irving Pl. and La Fayette Pl., 1st Ward			1	Bit. Con.	Nov. 5, 1918
Wisconsin Const. Co.	Alley Blk. 227, Perkins' Subd., bet. Farwell, Oakland, La Fayette and Windsor Pl., 1st Ward			1	Bit. Con.	Nov. 5, 1918
Wisconsin Const. Co.	Alley Blk. 239, Cambridge Subd., bet. Royal and Brady, Farwell and Prospect Aves.			1	Bit. Con.	Nov. 7, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Wisconsin Const. Co	Alley Blk. 234, A. L. Kane's Subd., bet. Farwell, Oakland, Kane and Irving Pl.			1	Bit. Con.	Nov. 7, 1918
Milwaukee Gen'l Const. Co	Alley Blk. 13, Cont. Trowbridge Park, and Blk. 4, Gudert & Steinmueller's Subd., bet. Burnham and Rogers Sts., and 25th and 26th Aves., 11th Ward			1	Bit. Con.	Nov. 7, 1918
White Const. Co	Alley Blk. 11, Wechselberg's & Elliott's Subd., bet. 11th and 12th Aves., and Scott and Washington Sts., in the 23rd Ward			5	Asphalt	Nov. 10, 1922
John Weiher	Alley Blk. 223, Cambridge Subd. No. 2, and Subd. of Lots 11 and 12, Blk. 223, Cambridge Subd. No. 2, and Lot 10, Blk. 223, A. L. Kane's Subd., bet. Bartlett and Windsor, and Newhall and Cambridge Ave., 1st Ward			1	Bit. Con.	Nov. 10, 1918
John Weiher	Alley Blk. 235, Cont. A. L. Kane's Subd., bet. Bartlett, Oakland, Kane and Irving Pl., 1st Ward			1	Bit. Con.	Nov. 10, 1918
John Weiher	South Alley running E. & W., Blk. 123, bet. 12th St., Sheridan Lane, Cold Spring Ave. and Vliet, 2nd Ward			1	Bit. Con.	Nov. 6, 1918
John Weiher	Alley Blk. 6, Cont. Lewis. Subd., bet. 32nd, 33rd, Wright and Clarke Sts., in the 22nd Ward			1	Bit. Con.	Nov. 6, 1918
Paul C. Kroeck	Holle Pl. and South Alley in Blk. 1, Luedke's Subd., Blk. 1, H. Holle's Subd., F. Holle's Subd., etc., bet. 9th, 10th, Center and Hadley Sts., 25th Ward			1	Bit. Con.	June 22, 1918

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Milwaukee Gen'l Const. Co.....	Arthur Avenue	13th Ave.	14th Ave.	1	Bit. Con.	July 5, 1918
F. P. Caughlin Co.....	Astor St.	N. L. Juneau Ave.....	S. L. Ogden Ave.....	5	Asphalt	Oct. 19, 1922
Badger Const. Co.....	Biddle St.	E. L. Van Buren St...	W. L. Cass St.....	5	Asphalt	Nov. 2, 1922
F. P. Caughlin Co.....	Cambridge Ave.	Brady St.	Boylston Pl.	5	Asphalt	June 29, 1922
	and portions of Oakland and Bartlett Avenues					
Badger Const. Co.....	Cedar St.	16th St.	24th St.	5	Asphalt	June 30, 1922
Milwaukee Gen'l Const. Co.....	Chase St.	First Ave.	Chicago Ave.	1	Bit. Con.	July 12, 1918
Badger Const. Co.....	Cedar St.	27th St.	35th St.	5	Asphalt	July 19, 1922
Badger Const. Co.....	Cass St.	Juneau Ave.	Knapp St.	5	Asphalt	Sept. 24, 1922
White Const. Co.....	Dakota St.	Midland Ave.	5th Avenue	5	Asphalt	Nov. 10, 1922
Badger Const. Co.....	8th St.	Germania St.	North Ave.	5	Asphalt	June 22, 1922
White Const. Co.....	11th Ave.	Forest Home Ave.....	Windlake Ave.	5	Asphalt	June 25, 1922
Badger Const. Co.....	8th St.	Atkinson Ave.	Graham St.	5	Asphalt	Aug. 1, 1922
F. P. Caughlin Co.....	Finn Pl.	11th St.	12th St.	5	Asphalt	July 10, 1922
F. P. Caughlin Co.....	15th St.	Finn Pl.	Nash St.	5	Asphalt	Aug. 22, 1922
Badger Const. Co.....	15th St.	Grand Ave.	Wells St.	5	Asphalt	Aug. 20, 1922
Badger Const. Co.....	14th Ave.	Arthur Ave.	Hayes Ave.	5	Asphalt	Aug. 20, 1922
White Const. Co.....	4th Ave.	Dakota St.	Oklahoma Ave.	5	Asphalt	Sept. 22, 1922
White Const. Co.....	5th Ave.	Oklahoma Ave.	Dakota St.	5	Asphalt	Sept. 17, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Badger Const. Co	52nd St.	Washington Blvd.	A pt. 366 ft. So. of S. L. of Vine St.	5	Asphalt	Oct. 2, 1922
			17th St.	5	Asphalt	Oct. 2, 1922
F. P. Caughlin Co	Finn Pl.	12th St.	17th St.	1	Bit. Con.	Oct. 2, 1918
F. P. Caughlin Co	Finn Pl.	12th St.	17th St.	1	Bit. Con.	Nov. 5, 1918
Badger Const. Co	54th St.	N. L. Vliet St.	S. L. Washington Bl.	1	Bit. Con.	Nov. 2, 1922
Badger Const. Co	53rd St.	S. L. Pabst Ave.	N. L. Enterprise Land Co.'s Subd. No. 1	5	Asphalt	Oct. 31, 1922
			S. L. North Ave.	5	Asphalt	July 3, 1918
Badger Const. Co	54th St.	N. L. Vine St.	Teutonia Ave.	1	Bit. Con.	July 9, 1922
Wisconsin Const. Co	Groeling Ave.	Louis Ave.	20th St.	5	Asphalt	Aug. 28, 1918
F. P. Caughlin Co	Galena St.	13th St.	Chicago Ave.	1	Bit. Con.	Aug. 9, 1922
Milwaukee Gen'l Const. Co	Garden St.	Harrison Ave.	27th St.	5	Asphalt	Sept. 1, 1918
Badger Construction Co	Grand Ave.	13th St.	Hawley Road	1	Bit. Con.	Oct. 19, 1922
Wisconsin Const. Co	Galena St.	51st St.	N. L. Graham and Green Bay Ave.	5	Asphalt	Nov. 2, 1922
F. P. Caughlin Co	Green Bay Ave.	N. L. Atkinson St.	E. L. Fourth St.	5	Asphalt	Nov. 2, 1918
	7th St.	L. 1, Bl. 1, Segnitz S.	S. L. Pabst Ave.	1	Bit. Con.	June 22, 1922
Badger Const. Co	Garfield Ave.	W. L. Third St.	Summit Ave.	5	Asphalt	July 5, 1918
Wisconsin Const. Co	Hawley Rd. (55th St.)	N. L. Vliet St.	14th Ave.	1	Bit. Con.	July 6, 1918
F. P. Caughlin Co	Kane Pl.	Prospect Ave.	N. L. Sunny Slope	1	Bit. Con.	
Milwaukee Gen'l Const. Co	Kearney Pl.	13th Ave.				
John S. O'Neill	Kathryn Pl.	Vliet St.				

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
F. P. Caughlin Co.	Lisbon Ave.	Walnut St.	27th St.	5	Asphalt	Aug. 28, 1922
F. P. Caughlin Co.	Milwaukee St.	Juneau Ave.	Knapp St.	5	Asphalt	July 21, 1922
Badger Const. Co.	Marshall St.	Juneau Ave.	Ogden Ave.	5	Asphalt	Sept. 25, 1922
White Const. Co.	Midland Ave.	Dakota St.	Oklahoma Ave.	5	Asphalt	Sept. 17, 1922
White Const. Co.	Manitoba St.	2nd Ave.	8th Ave.	5	Asphalt	Nov. 10, 1922
Badger Const. Co.	North Ave.	W. L. 27th St.	W. L. 45th St.	5	Asphalt	Nov. 6, 1922
Badger Const. Co.	North Ave.	W. L. West 24th St.	W. L. 27th St.	5	Asphalt	Nov. 2, 1922
Milwaukee Gen'l Const. Co.	Orchard St.	1st Ave.	5th Ave.	1	Bit. Con.	May 24, 1918
Paul C. Kroeck	Orchard Pl.	27th Ave.	28th Ave.	1	Bit. Con.	Aug. 7, 1918
F. P. Caughlin	Richards St.	S. L. Franklin St.	N. L. Keefe Ave.	5	Asphalt	Nov. 6, 1922
White Const. Co.	2nd Ave.	Windlake Ave.	Lincoln Ave.	5	Asphalt	June 25, 1922
Badger Const. Co.	Sherman Blvd.	Wright St.	Center St.	5	Asphalt	July 23, 1922
Wisconsin Const. Co.	Sheridan Lane	Vliet St.	Cherry St.	1	Bit. Con.	July 9, 1918
F. P. Caughlin Co.	16th St.	Nash St.	Finn Pl.	5	Asphalt	Aug. 17, 1922
Badger Const. Co.	16th St.	Cedar St.	Prairie St.	5	Asphalt	Aug. 22, 1922
F. P. Caughlin Co.	17th St.	Finn Pl.	Nash St.	5	Asphalt	Sept. 4, 1922
White Const. Co.	7th Ave.	Dakota St.	Oklahoma Ave.	5	Asphalt	Sept. 22, 1922
White Const. Co.	2nd Ave.	Dakota St.	Oklahoma Ave.	5	Asphalt	Sept. 17, 1922
White Const. Co.	6th Avenue	Dakota St.	Oklahoma Ave.	5	Asphalt	Sept. 22, 1922
George Czerwinski	10th St.	St. Paul Ave.	Clybourn St.	5	Brick	June 11, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt., Yrs.	Kind Material	Expiration Guarantee
Milwaukee Gen'l Const. Co.	13th Ave.	Arthur Ave.	Windlake Ave.	1	Bit. Con.	July 5, 1918
Badger Const. Co.	3rd St.	Keefe Ave.	612 ft. N. of N. L. of Keefe Ave.	5	Asphalt	Aug. 18, 1922
			Oklahoma Ave.	5	Asphalt	Sept. 17, 1922
White Const. Co.	3rd Ave.	Dakota St.	N. L. Clybourn	5	Brick	Oct. 25, 1922
Manger & McGucken Const. Co.	22nd St.	Sycamore St.	Ogden Ave.	5	Asphalt	July 13, 1922
F. P. Caughlin Co.	Van Buren St.	Juneau Ave.	Juneau St.	5	Asphalt	July 24, 1922
F. P. Caughlin Co.	Van Buren St.	Mason St.	Mason St.	5	Asphalt	Sept. 17, 1922
Badger Const. Co.	Van Buren St.	Wisconsin St.	W. L. of 32nd St.			
F. P. Caughlin Co.	Vliet St.	W. L. of 11th St.	W. L. Highland Bl.	5	Asphalt	Nov. 6, 1922
	Vliet St.	W. L. of 35th St.	13th Ave.	5	Asphalt	Aug. 21, 1922
White Const. Co.	Windlake Ave.	Lincoln Ave.	1st Ave.	5	Asphalt	Aug. 22, 1922
White Const. Co.	Washington St.	Reed St.	West City Limits	5	Asphalt	Nov. 10, 1922
Badger Const. Co.	Washington Bl.	W. L. 47th St.				

PERMITS ISSUED DURING THE YEAR ENDING DECEMBER 31, 1917.

1917	Excavations in Streets and Alleys		Deposit Building Material		House Drains		Storm Drains		Number of Extensions	Number of House Moving	Number of Miscellaneous
	No.	Amount	No.	Amount	No.	Amount	No.	Amount			
January	54	$ 57.00	64	$ 123.00	9	$ 66.00	...	.....	62	3	100
February	84	85.00	50	100.00	3	5.00	...	.....	40	2	104
March	121	140.00	117	181.00	29	84.00	...	.....	129	5	196
April	314	493.00	352	422.00	215	841.00	6	$ 15.00	219	6	396
May	284	449.00	412	486.00	198	671.00	11	33.00	267	6	273
June	244	1,005.00	330	404.00	787	2,244.00	62	186.00	182	7	294
July	242	354.00	271	330.00	125	336.00	36	108.00	185	4	251
August	192	355.00	266	344.00	217	1,167.00	66	.....	136	10	246
September	192	262.00	202	283.00	116	338.00	17	48.00	144	5	233
October	192	257.00	185	248.00	105	1,218.00	5	15.00	153	6	227
November	180	227.00	117	157.00	199	873.00	32	96.00	149	4	187
December	79	118.00	35	109.00	54	172.00	2	6.00	59	3	103
	2178	$ 3,802.00	2401	$ 3,187.00	2057	$ 8,015.00	237	$ 507.00	1725	61	2610

Paid Permits issued..... 6,873

Free Permits issued..... 4,396

Total.....11,269

Received for Excavating Permits.....$ 3,802.00

Received for Deposit Building Material Permits..... 3,187.00

Received for House Drain Permits..... 8,015.00

Received for Storm Drain Permits..... 507.00

Total.....$15,511.00

STATEMENT OF TOTAL ASSESSMENT FOR STREET CONSTRUCTION LEVIED FOR YEAR 1917—BEING FOR WORK DONE DURING 1917 AND THE 1917 INSTALLMENT OF PREVIOUS BONDS, AND THE 1917 INSTALLMENTS FOR PREVIOUS ASSESSMENTS.

WARD	Total 1917 Work Assessable	Installment of 1917 Work Assessed	1917 Installment of Previous Bonds	1917 Installments of Previous Assessments	Total 1917 Assessments
1	$ 58,863.28	$ 9,811.98	$ 859.78	$ 1,148.45	$ 11,820.21
2	52,580.26	8,766.80	1,511.85	6,571.14	16,849.79
3	53,103.28	8,850.62	2,338.34	4,579.68	15,768.64
4	43,407.96	7,234.75	2,388.91	2,689.14	12,312.80
5	44,886.72	7,481.09	437.58	116.90	8,035.57
6	21,728.76	3,621.48	2,173.93	1,001.12	6,796.53
7	4,757.49	792.94	1,038.03	635.83	2,466.80
8	20,898.99	3,483.22	1,020.13	250.16	4,753.51
9	48,467.87	8,078.06	915.51	.....	8,993.57
10	.....	.....	651.82	.....	651.82
11	5,539.87	2,208.93	4,618.19	8,492.26	15,319.38
12	19,603.22	3,718.78	827.69	449.87	4,996.34
13	3,211.21	1,057.77	1,673.62	6,936.86	9,668.25
14	122,780.00	24,908.16	3,217.27	5,368.31	33,493.74
15	38,665.26	6,444.29	2,101.76	2,096.06	10,642.11
16	60,246.90	14,524.89	1,365.74	2,717.74	18,608.37
17	17,860.28	6,425.07	2,988.41	6,506.42	15,919.90
18	11,664.37	1,944.20	4,033.00	9,996.94	15,974.14
19	135,553.76	23,983.15	2,165.39	5,295.00	31,443.54
20	10,568.57	2,378.16	4,004.25	8,703.88	15,086.29
21	45,151.27	7,525.27	1,642.98	14,355.66	23,523.91
22	103,482.80	17,912.53	4,369.11	7,237.01	29,518.65
23	6,719.44	3,060.69	2,120.46	593.85	5,775.00
24	29,227.08	4,871.18	4,959.67	7,591.71	17,422.56
25	57,931.21	22,032.64	3,794.65	4,362.71	30,190.00
Total	$1,016,899.85	$201,111.65	$ 57,218.07	$107,696.70	$366,031.42

Report

Assessment Department

Department of

Public Works, 1917

COMPARATIVE STATEMENT.

For what purpose—	Amount.
'otal special assessments levied by the Department of Public Works for the year 1916	$534,948.93
'otal special assessments levied by the Department of Public Works for the year 1917	678,398.36

GRAND RECAPITULATION

f special assessments for street and alley improvements, of street mprovement bonds, of special assessments and water pipe assessments by the Department of Public Works.

For what purpose—	Amount.
treet improvement installments for 1917	$201,116.65
treet improvement installments for work prior to 1917	164,914.77
pecial assessments for sewers	31,538.85
pecial assessments for opening streets and alleys	2,016.87
pecial assessments for vacating streets and alleys	1,640.00
pecial assessments for laying water pipe	20,029.25
pecial assessments for laying house drain service and water connections	52,782.45
pecial assessments for laying cement sidewalks	17,218.23
pecial assessments for sprinkling and flushing streets	66,251.02
pecial assessments for oiling streets	98,414.03
pecial assessments for removing trees	18.68
pecial assessments for removing earth from sidewalks	991.08
pecial assessments for cutting noxious weeks	5,592.89
pecial assessments for removing snow from sidewalks	11,559.56
pecial assessments for miscellaneous	4,314.03
Total	$678,398.36

RECAPITULATION

of assessments levied by the Department of Public Works for street and alley improvements during the year 1917.

Ward	Total cost of 1917 Assessable work	Installments for 1917
First	$ 58,863.28	$ 9,811.98
Second	52,580.26	8,766.80
Third	53,103.28	8,850.62
Fourth	43,407.96	7,234.75
Fifth	44,886.72	7,481.09
Sixth	21,728.76	3,621.48
Seventh	4,757.49	792.94
Eighth	20,898.99	3,483.22
Ninth	48,467.87	8,078.06
Tenth	.....	.....
Eleventh	5,539.87	2,208.93
Twelfth	19,603.22	3,718.78
Thirteenth	3,211.21	1,057.77
Fourteenth	122,780.00	24,908.16
Fifteenth	38,665.26	6,444.29
Sixteenth	60,246.90	14,524.89
Seventeenth	17,860.28	6,425.07
Eighteenth	11,664.37	1,944.20
Nineteenth	135,553.76	23,983.15
Twentieth	10,568.57	2,378.16
Twenty-first	45,151.27	7,525.27
Twenty-second	103,482.80	17,912.53
Twenty-third	6,719.44	3,060.69
Twenty-fourth	29,227.08	4,871.18
Twenty-fifth	57,931.21	22,032.64
Total amounts	$1,016,899.85	$201,116.65

RECAPITULATION

of assessments by the Department of Public Works for the construction of main sewers during the year 1917.

No. of assessments	Amount
853	$31,538.85

OPENING AND EXTENSION OF STREETS AND ALLEYS.

The damages awarded for the property proposed to be taken in the several proceedings were $5,630.00, of which amount the sum of $1,851.87 was assessed as benefits to surrounding property, and $3,778.13 was chargeable to Street and Alley Opening Fund.

The benefits assessed for the property proposed to be vacated in the several proceedings were $1,675.00, of which amount the sum of $35.00 was awarded as damages and $1,640.00 was assessed as benefits to surrounding property.

The damages awarded for property proposed to be taken for a school site between Seventh and Eighth Streets, and between Mill Street and a point 347 feet south of Mill Street, in the Twenty-first Ward were $5,375.00.

The damages awarded for property proposed to be taken for extending the Twenty-seventh Street school grounds in the Fifteenth Ward were $18,600.00.

The damages awarded for property proposed to be taken for widening and extending the North Pierce Street School Grounds, in the Thirteenth Ward were $11,400.00.

The damages awarded for property proposed to be taken for school site being Lots 9, 10, 11 and 12, G. H. Chase's Subdivision and Lots "U" and "T", Chase's Partition, in the 17th Ward were $22,150.00.

The damages awarded for property proposed to be taken for Harbors, Docks, Wharves, Piers, Waterslips and Lake and Railway Terminals between Polk and Oregon Streets and East of Beach Street, in the Third Ward were $17,650.00.

The damages awarded for property proposed to be taken for the purpose of condemnation of certain lands in what is known as Jones Island, for a site for sewage disposal works, in the Fifth Ward were $137,959.90.

The damages awarded for property proposed to be taken for the purpose of condemnation of certain lands in what is known as Jones Island, for public grounds, for permanent harbor improvements, docks, wharves, piers, water channels and lake and railway terminals, for public use, in the Fifth Ward were $393,327.46.

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR OPENING STREETS AND ALLEYS.

Ward	STREET	FROM	TO	Damages awarded for property taken	Benefits assessed against property	Amount chargeable to Street and Alley Opening Fund
25th	18th Street	Teutonia Avenue	Davis Street	$1,665.00	$ 976.87	$ 688.13
3rd	Alley, running from Mason to Oneida Street, between Jackson and Jefferson Streets			4,130.00	1,040.00	3,090.00
	Total			$5,795.00	$2,016.87	$3,778.13

Ward	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

*Includ

**Includ

STATEMENT OF SPECIAL ASSESSMENTS LEVIED DURING THE YEAR ENDING DECEMBER 31st, 1917.

Ward	Sewers	House drains and water connections	Water pipe	Repairing and constructing cement sidewalks	Sprinkling and flushing streets	Oiling streets	Removing dead trees	Removing earth from sidewalks	Cutting noxious weeds	Removing snow from sidewalks	Opening streets and alleys	Vacating streets and alleys	Miscellaneous	Grand total	Ward
1	.....	$ 279.50	.....	$ 987.96	$ 3,057.88	$ 3,619.54	.....	.....	$ 192.75	$ 492.95	.....	.....	$ 0.95	$ 8,631.53	1
2	.....	55.50	.....	774.33	3,029.34	2,470.77	.....	.....	.....	** 206.50	.....	.....	23.01	6,559.45	2
3	.....	71.60	.....	* 870.60	5,591.58	1.769.94	.....	.....	21.93	985.30	$ 1,040.00	.....	1,086.66	11,437.61	3
4	.....	.....	.....	1,657.15	4,526.89	862.76	$ 6.35	.....	17.80	109.75	.....	.....	47.51	7,228.21	4
5	.....	.....	.....	573.73	4,099.38	4,807.70	4.08	$ 9.60	14.70	198.80	.....	.....	9.08	9,717.07	5
6	.....	.....	.....	497.37	2,442.49	4,273.98	.....	.....	23.50	89.50	.....	.....	59.34	7,386.18	6
7	.....	.....	.....	398.89	1,652.31	5,731.70	7.50	.....	11.30	76.05	.....	.....	.....	7,877.75	7
8	.....	.....	.....	450.94	1,415.33	2,929.49	.....	1.29	1.20	82.05	.....	.....	8.38	4,888.68	8
9	.....	.....	.....	436.60	2,073.68	2,514.75	.....	.....	12.30	52.27	.....	.....	.81	5,090.41	9
10	.....	.....	.....	261.10	1,444.87	3,798.61	.....	.....	18.90	66.15	.....	.....	25.89	5,615.52	10
11	$ 1,508.92	147.60	.....	941.88	2,383.26	2,554.48	.....	31.00	85.30	891.75	.....	.....	10.73	8,554.92	11
12	.....	.....	.....	1,025.64	2,450.03	2,328.73	.....	.....	82.50	127.25	.....	.....	4.81	6,018.96	12
13	.....	.....	.....	465.70	1,059.03	4,439.07	.....	.....	47.25	166.65	.....	.....	.....	6,177.70	13
14	5,183.93	24,591.00	$ 1,596.13	339.09	1,663.62	2,965.12	.....	192.00	174.35	685.51	.....	.....	3.05	37,393.80	14
15	.....	108.90	.....	731.32	1,675.04	3,634.83	.....	.....	161.17	175.81	.....	.....	2.57	6,489.64	15
16	1,734.40	2,574.90	1,644.75	259.39	2,367.34	4,129.01	.....	.....	123.70	95.20	.....	.....	12.11	12,940.80	16
17	94.92	535.60	2,048.28	712.46	2,697.77	3,970.92	.....	376.85	810.30	522.60	.....	.....	.....	11,769.70	17
18	659.73	.....	4,204.89	2,097.99	3,953.25	5,927.43	.....	29.00	922.10	1,363.08	.....	.....	320.23	19,477.70	18
19	.....	6,002.60	942.39	979.44	2,160.95	7,454.88	.....	.....	259.22	421.55	.....	.....	45.80	18,266.83	19
20	4,779.87	571.20	3.00	437.64	4,001.52	6,528.52	.....	.....	566.99	1,189.45	.....	$ 1,640.00	1,644.48	21,362.67	20
21	13,226.06	4,023.10	3,189.66	747.29	2,305.64	2,877.59	.75	71.65	531.50	600.09	.....	.....	5.63	27,578.96	21
22	927.80	4,987.70	2,627.45	175.87	3,491.35	5,534.03	.....	.....	409.27	839.10	.....	.....	13.18	19,005.75	22
23	637.38	.....	572.96	544.61	1,757.65	7,367.13	.....	230.09	349.41	928.73	.....	.....	.....	12,387.96	23
24	417.32	772.10	.....	478.14	2,688.68	2,439.47	.....	.....	104.15	353.73	.....	.....	5.17	7,258.76	24
25	2,368.52	8,061.15	3,199.74	373.10	2,262.14	3,483.58	.....	49.60	651.30	839.74	976.87	.....	984.64	23,250.38	25
	$31,538.85	$52,782.45	$20,029.25	$17,218.23	$66,251.02	$98,414.03	$ 18.68	$ 991.08	$ 5,592.89	$11,559.56	$ 2,016.87	$ 1,640.00	$ 4,314.03	$312,366.94	

*Includes $5.84 re-assessment.

**Includes $1.50 re-assessment.

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENT S FOR VACATING STREETS AND ALLEYS.

Ward	STREET	FROM	TO	Benefits assessed against property	Damages awarded	Excess of damages
17th	That part of Pine St. a	s lies between Montana st. and a po	int 140 feet South of Russell Ave....	$ 2.00	$ 2.00	.....
20th	Thirty-first St.	Concordia Ave.	Townsend St.	1,640.00	None	1,640.00
20th	Alley running East and	West from Right of Way of C. M. &	St. Paul Ry. Co. to Thirty-first St.,			
	between Concordia A	ve. and Townsend St.....	.....	8.00	8.00	.....
20th	East and West 5 feet of	Alley running North and South be	tween Concordia and Auer Aves. and			
	between West Twent	y-fourth and Twenty-fifth Sts.....	.....	20.00	20.00	.....
20th	Alley running North and	South from Center to Hadley sts., b	etween Thirty-fifth and Thirty-sixth			
	Sts.	.....	.....	2.00	2.00	.....
24th	Windlake Ave.	Fifteenth Ave.	Cleveland Ave.	2.00	2.00	.....
24th	Part of Alley running N	orth and South from Grant St. to B	echer St., between Twenty-fourth and			
	Twenty-fifth Aves,..	.....	.....	1.00	1.00	.....
	Total.....	.....	.....	$1,675.00	$ 35.00	$1,640.00

Report of the

Bureau of Street Construction and Repair

For the Year Ending

December 31,

1917.

REPORT OF THE BOARD OF STREET CONSTRUCTION.

January 1st, 1918.

Mr. Percy Braman,
Deputy Commissioner,
Public Works Department.

Dear Sir:

I herewith submit the following report of the bureau of Street Construction and Repair for the year ending December 31st, 1917.

The important street improvements completed this year include the following: North Water, from East Water to Van Buren St., with a hard sandstone pavement—resurfacing of Grand Ave. with a standard sheet asphalt pavement, paving of 35th Street, from Vliet to Pabst Ave., from Vliet to Cherry with a sandstone pavement, from Cherry to Pabst Ave. with a creosote block pavement. This improvement was a much needed one, owing to the narrow condition of the roadway between the track and the curb line, the street being macadam and next to impossible to keep in a fair state of repair to permit of heavy traffic of which there was considerable. Oneida Street, from Broadway to Market St., was paved with a hard sandstone pavement to replace the old brick pavement which had reached a deplorable condition of deterioration. Vliet St., from 11th St. to Highland Blvd., which was originally laid in 1913, was also resurfaced with a standard sheet asphalt pavement. North Ave., from 27th to 45th St., was replaced with a standard sheet surface. We are contemplating this year that part of North Ave. from 7th west to 27th St., which will give us a straight stretch of asphalt surface and will relieve conditions greatly.

Work contemplated for 1918 consists of the resurfacing of Forest Home Ave., from Forest Home Cemetery to 26th Ave., which is in a very bad condition. 1st Avenue, from 6th St. Viaduct to Mineral will be replaced with creosote block pavement.

There was an increase in cost of 22% over 1916, which was occasioned due to the difficulty in obtaining material and on account of car shortage, and the increased labor cost. The biggest increase was in the cost of the creosote block, which was 29.6% greater than in 1916. The smallest increase was cement concrete, which was 15.38%.

We have made some changes in our cement concrete alley specifications, which will be the means of lowering the cost of this work over previous years. There will probably be no decrease in this work for the year 1918 over previous years, owing to the great advance in material prices, and also the fact that labor cost is much higher than in previous years. However, if the specifications are carried out, in my opinion, there is no question but concrete will not only prove to be a more durable pavement for this purpose, but will also cost much less than the pavements heretofore used in alleys.

The following is in detail of the various types of pavement laid in 1917 together with such comparison as I have been able to get from the records of the amount of yardage in 1916, also the increase of the yardage for various types of pavement. The following is the increase in detail over 1916:

	1917 sq. yd.	1916 sq. yd.
Creosote Block	$3.24	$2.50
Brick	2.51	2.00
Sandstone	3.70	3.02
Asphalt	2.71	1.82
Bituminous Concrete	1.56	1.32
Cement Concrete	1.50	1.30

The comparison of yardage between 1916 and 1917 is as follows:

	1917	1916	Increase	Decrease
Asphalt Streets	274,950.14	231,654.53	43,295.61	.....
Asphalt Alleys	1,581.48	1,752.12	.....	170.64
Brick Streets	10,300.51	8,388.16	1,912.36	.....
Brick Alleys	10,493.49	12,538.16	.....	2,044.67
Brick Gutters	25,647.87	12,954.61	12,693.26	.....
Bit. Conc. Streets	34,052.66	94,096.27	.....	60.043.61
Bit. Conc. Alleys	56,755.06	2,222.39	54,532.67	.....
Granite	8,208.23	5,196.86	3,011.37	.....
Sandstone	23,924.42	14,455.88	9,468.34	.....
Creosote Wood Blocks	24,371.60	56,454.64	.....	32,083.04
Cement Concrete	28,289.90	31,954.54	.....	3,664.64

The report of the yardage cost for the Repair Department for the various types of pavement is as follows:

ASPHALT REPAIRS.

	Yards	Cost
Mar.	3647	$ 1,995.84
Apr.	10707	5,479.177
May	7344	4,203.658
June	7341	3,744.844
July	6715	3,978.106
Aug.	6431	3,435.356
Sept.	14621	6,927.361
Oct.	7144	4,015.039
Nov.	54.5	103.55
	64004.5	$ 33,882.931

Average cost .....$0.529 sq. yd.

BITUMINOUS MACADAM REPAIRS.

	Yards	Cost
Apr.	1397	$ 787.908
May	18867	8,232.309
June	58466	26,880.195
July	40140	16,765.377
Aug.	57323	26,648.855
Sept.	454	243.798
Oct.	65438	27,086.363
	242085	$106,644.805

Average cost .....$0.44 sq. yd.

BLOCK PAVEMENT REPAIRS.

	Yards	Cost
Mar.	928	$ 1,452.70
Apr.	2685	2,696.60
May	2498	2,085.954
June	3569	5,251.28
July	5122	8,483.391
Aug.	2075	2,158.496
Sept.	2613.5	2,030.14
Oct.	274	458.997
Nov.	1160	2,668.13
Dec.	384	578.08
	21308.5	$ 27,863.768

Average cost.....$1.307 sq. yd.

WATERBOUND MACADAM REPAIRS.

	Yards	Cost
June	2323	$ 123.583
July	4515	571.147
Aug.	7821	1,195.208
Sept.	45840	18,555.925
	60499	$ 20,445.863

Average cost .....$0.338 sq. yd.

BITUMINOUS CONCRETE REPAIRS.

	Yards	Cost
Sept.	601	$486.84

Average cost .....$0.81 sq. yd.

Department of Public Works

Bureau of Street Sanitation

Annual Report

1917

Milwaukee, January 2, 1918.

Mr. Percy Braman,

Deputy Commissioner of Public Works,

Milwaukee, Wisconsin.

Dear Sir:

Following is the Annual Report of the Bureau of Street Sanitation for the year ending December 31st, 1917, showing detailed reports of the costs and statement of work performed:

1. Cleaning Streets and Alleys.
2. Ash and Rubbish Collection.
3. Garbage Collection.
4. Collection and Removal of Dead Animals.
5. Catch Basin Cleaning.
6. Sprinkling and Flushing.
7. Oiling.
8. Snow Removal.
9. Drinking Fountains.
10. Cutting Weeds.
11. Election Booths.
12. Assessable Service.

CLEANING STREETS AND ALLEYS, 1917.

During the year of 1917, there were 43,585 loads of sweepings removed, or 130,755 cubic yards.

The cost of cleaning streets and alleys for the entire year of 1917 was as follows:

Labor	$ 77,997.04
Team	50,911.98
Machine	833.60
White-wing	45,578.44
Total	$175,321.06

Labor was paid at the rate of $2.40 per day; teams at $5.50 per day.

ASH AND RUBBISH COLLECTION.

The following is a comparison of the yardage and cost of collection for the past seven years. Wages for this work were at the rate of $2.40 per day for labor and $5.50 per day for teams.

1917 Collection was 366,120 cubic yards.....Cost $266,905.05
1916 Collection was 333,375 cubic yards.....Cost 216,496.62
1915 Collection was 320,373 cubic yards.....Cost 211,939.83
1914 Collection was 321,669 cubic yards.....Cost 226,219.24
1913 Collection was 319,848 cubic yards.....Cost 225,421.50
1912 Collection was 293,646 cubic yards.....Cost 229,344.26
1911 Collection was 188,737 cubic yards.....Cost 174,619.51

Average cost per cubic yard was:

1917	$0.70
1916	.65
1915	.66
1914	.70
1913	.70
1912	.78
1911	.93

Comparing the cost of 1911 with that of 1917, shows a decrease of $0.23 per cubic yard.

In 1916 labor was paid $0.25 per hour for the first nine months and $0.30 per hour the last three months. Teams were paid $5.00 per day.

STATEMENT OF ASH AND RUBBISH COLLECTION DURING 1917.

Month	Loads	Total cost of collection
January	16,423	$ 36,210.10
February	18,313	39,400.97
March	13,964	30,194.35
April	12,319	26,217.46
May	9,764	21,742.78
June	7,799	17,251.06
July	4,179	8,961.57
August	2,723	6,189.00
September	2,547	5,905.49
October	5,456	14,139.06
November	12,490	27,902.60
December	16,164	32,790.61
Total	122,040	$266,905.05

1 load—3 cubic yards.
Total collection was 366,120 cubic yards.
Average cost of removal per cubic yard was $0.70.

GARBAGE COLLECTION—1917.

The following is a statement of garbage collection and comparative cost per ton for the past six years. The wages paid were $4.00 per day. Each collector must bring in two loads for a day's pay.

STATEMENT OF GARBAGE COLLECTION—1917.

Month	Loads	Tons	Cost of collection
January	4,530	2,173	$ 8,980.00
February	3,897	1,975	7,924.00
March	4,500	2,109	8,848.00
April	5,136	2,269	10,084.00
May	5,372	2,319	10,682.00
June	5,478	2,680	10,792.00
July	6,389	3,104	12,576.00
August	6,511	3,346	13,090.00
September	6,142	3,072	12,060.00
October	6,589	3,261	13,048.00
November	5,392	2,572	10,690.00
December	5,266	2,275	10,604.00
Total	65,202	30,975	$129,378.00

Average load was 950 lbs.

Average cost of collection per ton was $4.18.

Average cost per ton was:

1917	$4.18
1916	3.07
1915	2.87
1914	2.94
1913	2.42
1912	2.47

Teams increased from $3.50 to $4.00 per day.

Loads of garbage very light, there being very little garbage, mostly paper and waste materials.

COLLECTION AND REMOVAL OF DEAD ANIMALS.

For this work we employ one permanent collector, and add a temporary collector during the warm months of the year. The wages paid are $4.00 per day. Following is a statement of the work done.

Month	Small Animals	Large Animals	Total	Cost of Collection
January	301	...	301	$ 104.00
February	272	...	272	96.00
March	397	...	397	112.00
April	374	...	374	100.00
May	405	...	405	144.00
June	433	...	433	212.00
July	445	...	445	200.00
August	472	...	472	218.00
September	383	...	383	198.00
October	352	...	352	216.00
November	315	...	315	104.00
December	297	...	297	104.00
Total	4,446	...	4,446	$1,808.00

Average cost of collection per small animal was $0.41.

NOTE—Collector was paid $0.50 per day more in 1917 than in 1916. Also less animals were collected.

CATCH BASIN CLEANING.

The following is a statement of work done and itemized cost.

STATEMENT OF CATCH BASIN CLEANING DURING 1917.

Month	Number cleaned	Loads hauled to dump	Cost of labor	Cleaning team	Total
January	18	18	$ 34.00	$ 22.00	$ 56.00
February	56	59	247.06	82.50	329.56
March	266	298	1,415.83	486.00	1,901.83
April	539	632	989.81	662.74	1,652.55
May	1,113	1,234	2,010.73	1,507.64	3,518.37
June	1,302	1,517	2,295.50	1,761.73	4,057.23
July	1,903	2,056	2,776.74	1,879.93	4,656.67
August	2,312	2,265	3,086.38	2,131.20	5,217.58
September	1,302	1,279	1,630.25	1,051.86	2,682.11
October	717	628	600.52	222.07	822.59
November	505	530	585.70	371.94	957.64
December	4	5	7.30	5.50	12.80
Total	10,037	10,521	$15,679.82	$10,185.11	$25,864.93

Total cubic yards of dirt removed was 21,042.
Cost of cleaning single basin was $2.57.
Average cost of cleaning and removing per cubic yard $1.285.

SPRINKLING—FLUSHING—1917.

During the season 246.16 miles of streets were sprinkled and 184.36 miles of streets were flushed at a total cost of $79,319.36. Of this amount $66,251.02 was assessable; the balance $13,068.34 was non-assessable, this being the City's portion for public property, street and alley intersections and cost of water. This amount was charged to the "General City Fund".

267,140,614 gallons of water were used for sprinkling and flushing at a cost of $16,028.43. This includes water for car tracks (water not assessable). Charge of hydrant rent was $10,265.25 (non-assessable). Average rate of assessment per front foot for sprinkling was $0.021; for flushing $0.02.

OILING—1917.

During the season, 126 miles of streets were oiled. The total cost of oiling, including oil, labor, team and materials, was $115,693.39. Of this amount $98,414.03 was assessable, $32,197.87 for straight oiling, and $66,216.16 for resurfacing and oiling macadam streets, and $17,279.36 for non-assessable.

The non-assessable portion was for oiling street and alley intersections and public property. The average rate of assessment per front foot was $0.048. 991,043 gallons of oil were used.

Contract price of oil was as follows:

Standard Oil Company	$0.0534
Barber Asphalt Paving Company	.0625
Barrett Manufacturing Company	.085

Following is a comparison of street oiling during the past nine years:

Year	Miles of street oiled	Cost
1909	3	$ 1,585.85
1910	16	5,435.42
1911	71	34,891.34
1912	28	7,120.90
1913	101	54,786.44
1914	114	53,480.26
1915	122	54,578.86
1916	146	108,965.31
1917	126	115,693.39

SNOW REMOVAL.

The total cost of snow removal from streets, street intersections, crosswalks, gutters, and private sidewalks was $47,532.32 divided as follows:

(The assessable service was $11,559.56 for removing snow from private walks.)

The City's portion for removing snow from streets, gutters and public walks was $25,911.98 for labor and $10,060.78 for team hire. Total $35,972.76.

DRINKING FOUNTAINS—1917.

During the year $600.64 was spent for new equipment. Three bubblers and one horse trough were erected. $729.90 were spent for repairs during the year. Total cost of water for the year was $8,349.57. The total expense was $9,680.11.

CUTTING WEEDS—1917.

Noxious weeds growing on private property are cut down when necessary and the cost of this work is assessed to the property. This work is done by hand and machine.

During the last year $5,592.89 were spent for this purpose and assessed to the property.

ELECTION BOOTHS—1917.

This department handles all the election booths and equipment for the Election Commission, whenever necessary, and the expense of same is paid for by said Commission.

The expense of the 1917 election (Judicial) for erecting, maintaining and removing booths, was $4,397.71 and for the special election for State Senator (in the 8th District) was $394.07; total, $4,791.78.

MISCELLANEOUS ASSESSMENT SERVICE.

This service is assessed to the property affected, the cost being as follows:

Removing earth—labor	$623.40
Removing earth—team	411.43
Abating nuisances—labor	52.64
Abating nuisances—team	16.50
Removing trees—labor	22.22
Removing trees—team	4.82

Respectfully submitted,

CHAS. O. DAVIS,

Superintendent Street Cleaning.

Report of

Bureau of Bridges and Public Buildings

1917

Milwaukee, Wis., March 27th, 1918.

Mr. Percy Braman,

Deputy Commissioner of Public Works,

Dear Sir:

Following is the annual report of the Bureau of Bridges and Public Buildings for the year 1917. In subsequent reports the reorganization of this bureau has been recommended and for the next ten years the engineering work of this department will be so large that it would be advisable to have a distinct head at this branch of the work, one who would be responsible for all engineering work, and the administrative office be relieved of such responsibility, considering that the maintenance and operation of bridges, the seven natatoriums, the bathing beaches, the Municipal Garage and all labor, materials, supplies, etc., for doing the work in these several branches, and all fees collected by the City of Milwaukee from these branches, must come under and be scrutinized by the head of this department.

It is necessary that more stringent laws or means of letting contracts should be employed so that contractors may be held more responsible for delays of buildings under construction than what they have heretofore. This must be taken care of in letting future contracts.

REPORT OF BRIDGE CONSTRUCTION.

During the year a number of docks were completed, the contracts for which were let during the preceding year. These embraced docks at the foot of East Street, between the North Avenue dam and the Flushing Tunnel outlet, at the foot of National Avenue on the Kinnickinnic River, at the foot of the alley between Clybourn and Fowler Streets, and a dock fronting the C. M. & St. P. Ry. Co.'s property west of Reed Street.

A retaining wall was constructed at the northwest corner of the Muskego Avenue Bridge, this being made necessary by the widening of the river at this point. The paving in the street and sidewalk back of the wall remains to be laid.

The construction of a rubble mound breakwater in the harbor was begun and is expected to be completed during 1918. This is located at a distance of 600 feet from the shore line and extends

from the foot of Wisconsin Street to the mouth of the Milwaukee River. The area between this and the shore line will later be filled in.

Bridge work for this year was confined to the usual repairs and to a small amount of reconstruction. The latter included a new protection pier and new floor system for Pleasant Street Swing Bridge. The contract has been let for structural steel necessary to strengthen Cherry Street Swing Bridge and will soon be completed.

The old wooden stairway leading into the Menominee Valley at the foot of 35th St. had reached a very unsafe condition and was replaced by a reinforced concrete structure. This was financed jointly by the City of Milwaukee and the Town of Wauwatosa.

Track elevation work on the south side necessitated the construction during the year of a number of railings along sidewalks.

PROPOSED WORK.

Plans are complete for a new State Street Bridge across the Milwaukee River, but construction has been delayed until additional bonds could be sold to meet the increased cost under war conditions.

Test borings have been taken and the design and plans for the new North Avenue Viaduct are nearing completion. It is expected to begin construction during 1918. This will be a concrete structure extending from Humboldt Avenue to Cambridge Avenue, eliminating the present C. M. & St. P. R. R. grade crossing. It will have a clear roadway width of 40′-0″ compared with the present width of 17′-0″. Traffic from below the viaduct will be cared for by an approach from the south. The plans for the proposed viaduct are the result of considerable time spent on various preliminary plans with the object of obtaining an economical design adapted to increasing traffic conditions, and at the same time harmonious in outline and ornamentation with its surroundings.

Plans have been prepared for the reconstruction of Humboldt Avenue Bridge across the Milwaukee River, and located in the Twenty-first Ward and the village of Shorewood. The actual construction is expected to be completed during this year. The work contemplated at the present time on this bridge will be somewhat of a temporary nature, intended only to relieve the heretofore dangerous condition of the structure. In the course of a few years as the city grows in this direction, an appropriate concrete bridge should be built here.

Preliminary plans have been prepared for a reinforced concrete bridge to cost about $13,000 across the Kinnickinnic River at Cleveland Avenue.

With only two or three possible exceptions, the present bridges and viaducts are constructed to care for much lighter traffic than exists at the present time. In addition, many of them are of such age that they are now rapidly deteriorating. These conditions will require very great expenditures for new bridges and viaducts in the near future.

To design and supervise the construction work and at the same time care for repairs to existing structures, additional engineering help should be provided for this bureau, the present force being entirely out of proportion to the amount of work to be done.

South View Hospital.

Contracts for the construction of the west wing of the Isolation Hospital were let May 7th, 1915, and the building practically completed in January, 1917.

This wing is arranged to take care of the smallpox and diphtheria patients of the City of Milwaukee.

During construction it was decided by the Health Commissioner to change the larger wards into smaller cubicals so as to make possible the handling of, not only smallpox and diphtheria cases, but also any other complication of contagious diseases. This necessitated the changing of the various branches of work to conform to this change. These cubicals answered the purpose of an additional building for the treatment of erysipelas and kindred diseases.

Blue Mound Sanatorium.

The Dining Hall, Blue Mound Sanatorium contracts were let August 24th, 1916, and building completed in 1917. This building is designed to accommodate 125 patients. The service help have their own quarters on 2nd floor. The extension and construction of the various units of this institution have not materialized as fast as had been anticipated. Bond issues are being prepared to bring this institution to 125 patient capacity.

Contracts were let June 13th, 1917, for the Heating and Laundry Building and tunnel for the Blue Mound Sanatorium. Work completed December, 1917. This building contains the heating plant

for the entire group of present and future buildings and also contains a space for laundry purposes. A concrete tunnel was built to extend into that section of premises whereon all new buildings and where new contemplated buildings will be located. This tunnel takes care of all heating and hot water mains.

The contract for the sewerage system was let November 6th, 1916, and completed July 6th, 1917. This sewerage system, manholes, etc., connect up all the present buildings and is carried throughout the grounds to all future proposed buildings. In 1918 the sewerage disposal plant will be built at the termination of these sewers. The plans as approved by the Sewerage Commissioner of the City of Milwaukee are completed.

The contract for the water supply was let November 10th, 1917, and completed in December, 1917.

The contract for a 6-inch cast iron water main to be run from main in County Insane Asylum grounds to points inside of Blue Mound Sanatorium are completed. The City of Milwaukee furnished the water mains, meter, fire hydrants and connections, and the contractor laid same according to plans and surveys.

This gave the institution a supply of city water in place of the well with an unreliable capacity and a lime hard water, injurious and dangerous to the heating plant and hot water system.

Fifth Avenue Natatorium.

The building contracts for this building were let March 7th, 1917. Building progress was hindered by severe winter weather and difficulty in brick shipments.

This building will have a water filtering and sterilizing system for all water entering pool, thus insuring clean sterilized water at all times. I recommend that all present natatoriums be equipped with a similar system.

McKinley and South Shore Bath Houses.

Metal lockers of the double tier type have been placed in McKinley and South Shore Bath Houses. In McKinley Bath House 446 additional lockers were added and in South Shore 616. Changes were made in interior arrangements so as to accommodate these additional lockers.

Bridge Store House.

A first unit of reinforced concrete and brick store house was constructed at the bridge yard on Canal and East Streets. This building is built on a floating foundation.

Locker Building—Incinerator Plant.

A Locker Building was erected on the premises of the Incinerator Plant at the foot of Erie Street, containing 40 lockers, dressing, washing, shower and toilet rooms. Contracts let August 24th, 1917.

High Service Pumping Station Water Tower Addition.

An extension of 23 feet was added to the high service pumping station water tower, constructed of brick, cut stone, cornices, iron stairways and roof. Contract was let July 24th, 1917, and completed November 13th, 1917.

Lafayette Place Concrete Railing.

A concrete rail was constructed on Lafayette Place Bridge as a protection against automobile accidents. This rail was designed to add to the architecture of the bridge. Contract was let October 12th, 1917.

FUTURE WORK.

Prairie Street Natatorium being condemned sometime ago, the Common Council is again urged to make an appropriation to replace same on these premises or in the immediate neighborhood with a new building.

City Hall.

The terra cotta trimmings, ridges, etc., of the City Hall being in the building for the last 20 years, are in a dangerous condition and some of these must be taken down to insure the safety of the public.

Only such terra cotta will be removed that will not mar or detract from the architecture of the building, and such that is essential to its architectural design and such as is absolutely necessary in the practical sense will be replaced by new material.

Also recommend that the boiler and generator room be taken out from the basement of the City Hall and housed in a separate building, preferably near a river dock. This would cheapen the cost of power production and would secure a facility for handling the coal in quantities. One prime reason for removing the power plant from the basement of the City Hall is the danger to the steel structure through a steady vibration coming from the generators. While in service the vibrations are very noticeable in the Council Chamber and court rooms, these rooms having large spans.

Tabulated costs of this Bureau for the year 1917 are herewith appended.

Respectfully submitted,

DAVID McKEITH,

Acting Supt., Bridges and Public Buildings.

CONSTRUCTION.

TABLE No. 1.

Isolation Hospital	$ 14,026.87
Blue Mound Sanitarium	48,028.77
Fifth Avenue Natatorium	26,612.27
West Side Police Station	10,738.63
Viaduct Construction	1,570.32
Breakwater—Milwaukee Harbor	164,242.09
Construction Concrete Stairway—35th Street	1,806.94
Retaining Wall—Muskego Avenue	4,859.37
Bridge Shop Store House	2,030.97
Dock Construction	35,849.96
Protection Pier—Pleasant Street	3,747.33
Locker Building—Incinerator Plant	2,383.23
Addition to High Service Water Tower	6,269.10
	$322,165.85

TABLE No. 2.

BRIDGE COSTS.

	Operation	Roadways	Sidewalks	Machinery	Superstructure	Substructure	Houses	Electrical	Maintenance Total	Grand Total
Bascules	$61,044.55	$ 546.11	$ 1,179.03	$ 3,889.58	$ 944.27	$ 614.95	$ 1,013.74	$ 1,525.10	$ 9,712.78	$ 80,470.11
Swing	27,927.23	329.50	381.39	393.03	84.56	390.22	686.95	397.42	2,663.07	33,253.37
Stationary	6,575.19	6,527.32	436.33	.....	390.83	.....	6.86	.....	7,361.34	21,297.87
Grand Total	$95,546.97	$ 7,402.93	$ 1,996.75	$ 4,282.61	$ 1,419.66	$ 1,005.17	$ 1,707.55	$ 1,922.52	$19,737.19	$135,021.35

BRIDGE REPAIRS.

Roadways and Sidewalks Replaced	$ 7,214.83
Painting	5,144.82
Machinery Repairs	2,120.18
Steel Work Repairs	1,546.47
Repairs to Equipment, Scows, etc	1,210.04
Pits	802.50
Piling	21.20
Repairs to Bridges where Damaged by Vessels	583.26
	$18,643.90

TABLE No. 3.

CITY HALL COSTS.

	Total	Unit of Measure	No. of Units	Unit Cost
		Sq. ft. Radiation Surface	22,220	$0.531
Heat	$11,798.65	K. W. Hours	388,988	0.0235
Electricity—Switch Board Cost	9,108.74	Elevator Miles	29,304	0.564
Elevators	16,550.33	Sq. ft. Office Space	100,250	0.183
Cleaning and Caretaking	18,386.32			
Electric Lighting—Maintenance	2,792.17			
Plumbing System	355.84			
General Operation	7,646.04			
Miscellaneous Repairs	8,993.42			
		Sq. ft. Office Space	100,250	$0.754
Total	$75,631.51			

TABLE No. 4.

BATHING BEACH AND NATATORIUM.

	General Operation	Heat	Repairs	Gross	Receipts	Net	Attendance	Cost Per Bather
Center Street	$ 4,063.26	$ 2,991.85	$ 757.37	$ 7,812.48	$ 1,142.20	$ 6,670.28	80,187	$0.083
Jackson Street	3,528.79	3,320.09	356.91	10,283.15	1,118.55	6,087.24	69,127	0.088
Greenbush Street	4,595.32	3,012.37	2,016.19	9,623.88	2,303.40	7,320.48	80,702	0.091
Greenfield Avenue	4,471.46	3,063.42	211.93	7,746.81	2,001.89	5,744.92	111,226	0.052
North Avenue	4,458.38	2,782.68	1,632.70	9,498.78	915.45	7,958.61	93,842	0.085
Prairie Street	5,331.73	4,190.56	217.64	9,739.33	2,419.50	7,319.83	97,413	0.075
McKinley Park	9,337.75	.....	645.69	9,983.44	1,048.95	8,934.49	56,135	0.159
South Shore B. H.	5,712.97	.....	652 24	6,365.21	892.20	5,473.01	40,280	0.135
Total	$21,499.66	$19,359.97	$ 6,490.07	$71,053.08	$11,842.14	55,508.86	628,912	$0.096

TABLE No. 5.

MISCELLANEOUS COSTS.

Danger Lights, 1st and 18th Wards R. R. Bridges	$ 377.19
Comfort Station	648.04
Central Market	2,150.55
Garage	2,742.86
Work Done for Other Departments	10,752.09
Odd Jobs	322.73
	$16,993.46

SUMMARY.

Construction	$322,165.85
Bridge Operation and Maintenance	135,021.35
Bridge Repairs	18,643.90
City Hall	75,631.51
Bathing Stations	71,053.08
Miscellaneous	16,993.46
Total	$639,509.15
Total Overhead	$ 14,432.50
Overhead Percentage	2.25

Annual Report

of the

Superintendent of Plumbing and House Drain Laying

REPORT OF CONTRACT DRAINS AND WATER CONNECTIONS AND COST OF INSPECTION THEREOF IN THE FOLLOWING DESCRIBED STREETS DURING THE YEAR 1917.

STREET	FROM	TO	CONTRACTOR	INSPECTOR	COST
		WEST SIDE			
Cedar St.	16th St.	24th St.	G. Zimmermann	J. Savage	$12.00
Cedar St.	27th St.	35th St.	G. Zimmermann	J. Savage	24.00
Clybourn St.	20th St.	25th St.	W. T. Werner	A. Holthausen	84.00
Concordia Ave.	27th St.	30th St.	W. T. Werner	Wm. Voelz	24.00
Graham St.	Atkinson Ave.	Green Bay Ave.	F. A. Goll	J. Savage	40.00
Green Bay Ave.	Davis St.	No. City Limits	G. Zimmermann	E. Silberstorff	48.00
Groeling Ave.	Louis Ave.	Teutonia Ave.	W. T. Werner	Wm. Voelz	14.00
*Hawley Road	Pabst Ave.	S. L. of NeesKara H'ghts	G. Zimmermann	Kraatz and Silberstorff	40.00
Richard St.	Keefe Ave.	Franklin St.	G. Zimmermann	E. Silberstorff	64.00
Sherman Blvd.	Wright St.	Center St.	A. Kehrein	A. G. Barsch	No cost
Washington Blvd.	47th St.	W. City Limits	W. T. Werner	A. Holzhausen	60.00
3rd St.	Keefe Ave.	612 ft. No. of Keefe Ave.	W. T. Werner	Wm. Voelz	16.00
8th St.	Green Bay Ave.	Graham St.	W. T. Werner	A. Holzhausen	92.00
15th St.	Finn Pl.	Nash St.	W. T. Werner	E. Silberstorff	36.00
16th St.	Cedar St.	Vliet St.	F. Goll	J. Savage	4.00
17th St.	Finn Pl.	Nash St.	F. Goll	J. Savage	36.00
22nd St.	Sycamore St.	Clybourn St.	G. Zimmermann	J. Savage	8.00
51st St.	Elm. St.	North Ave.	W. T. Werner	Wm. Voelz	14.00

STREET	FROM	TO	CONTRACTOR	INSPECTOR	COST
53rd St.	No. Line of Enterprising Land Co. Sub. No. 1...	Pabst Ave.	W. T. Werner	A. Holzhausen	44.00
53rd St.	Pabst Ave.	North Ave.	G. Zimmermann	A. Holzhausen	68.00
54th St.	Vine St.	North Ave.	A. Kehrein	J. L. Bauer	52.00
				Total	$782.00
Weil St.	North Ave.	Hadley St. Contract not let.			
8th St.	Atkinson Ave.	Graham St. 1916 Contract—cancelled in 1917.			
9th St.	Graham St. to No. Line of Somres Sub. No. 1		F. Goll	J. Savage	$44.00
This contract is only partly finished—to be completed in 1918.					
				Total	$826.00

*Contract started in 1916. Inspection cost of work done in 1916 was $36.00.

EAST SIDE

Farwell Ave.	Kenilworth	North Ave.	G. Zimmermann	E. Silberstorff	$12.00
Van Buren St.	Martin St.	Oneida St.	G. Zimmermann	J. Savage	4.00
Cramer St.	Kenwood Blvd.	Edgewood Ave.	A. Kehrein	Nic Jacoby	98.00
This contract is only partly finished—to be completed in 1918.					
				Total	$114.00

REPORT OF HOUSE DRAIN AND WATER CONNECTIONS DONE UNDER PRIVATE CONTRACTS AND FOR WHICH INSPECTION IS PAID BY LAND OWNER OR DRAIN LAYER.

STREET	FROM	TO	CONTRACTOR	INSPECTOR	COST
		SHOREWOOD*			
Eastwood Pl.	W. of Maryland Ave.		A. J. Kehrein	Nic Jacoby	$12.00
Edgewood	Oakland	Downer	F. Goll	J. Savage	24.00
Jarvis St.	Murray to a point E. of Murray		G. Zimmermann	J. Savage	104.00
Maryland Ave.	Newton Ave.	Kensington Blvd.	F. Goll	J. Savage	250.00
				Total	$390.00

*The City of Milwaukee collects a fee of Five Dollars ($5.00) per connection to pay for inspection and clerical work.

REPORT OF CONTRACT DRAINS AND WATER CONNECTIONS AND COST OF INSPECTION THEREOF IN THE FOLLOWING DESCRIBED STREETS DURING THE YEAR 1917—Continued.

STREET	FROM	TO	CONTRACTOR	INSPECTOR	COST
		SOUTH SIDE			
Arthur Ave.	13th Ave.	14th Ave.	W. T. Werner	Wm. Voelz	$14.00
Garden St.	Harrison St.	Chicago Ave.	F. Goll	J. Savage	32.00
Midland Ave.	270 ft. No. of Dakota St.	Oklahoma Ave.	F. Goll	J. Savage	60.00
Windlake Ave.	Lincoln Ave.	13th Ave.	G. Zimmermann	J. Savage	16.00
2nd Ave.	Dakota St.	Oklahoma Ave.	A. J. Kehrein	J. Bauer	14.00
3rd Ave.	Montana St.	Oklahoma Ave.	A. J. Kehrein	Nic Jacoby	34.00
4th Ave.	Montana St.	Oklahoma Ave.	A. J. Kehrein	Nic Jacoby	32.00
5th Ave.	Montana St.	Oklahoma Ave.	A. J. Kehrein	Nic Jacoby	12.00
6th Ave.	Montana St.	Oklahoma Ave.	A. J. Kehrein	Nic Jacoby	20.00
7th Ave.	Montana St.	Oklahoma Ave.	A. J. Kehrein	Nic Jacoby	56.00
9th Ave.	Dakota St.	Oklahoma Ave.	F. Goll	J. Savage	88.00
10th Ave.	Dakota St.	Oklahoma Ave.	A. J. Kehrein	Nic Jacoby	24.00
11th Ave.	Forest Home Ave.	Windlake Ave.	G. Zimmermann	J. Savage	12.00
13th Ave.	Windlake Ave.	Arthur St.	F. Goll	J. Savage	12.00
24th Ave.	Mitchell St.	Burnham St.	F. Goll	J. Savage	4.00
				Total	$430.00

STATEMENT OF COST OF CONTRACT HOUSE DRAIN AND WATER CONNECTION INSPECTIONS AND SPECIAL HOUSE DRAIN INSPECTIONS—1917.

MONTH	Salaries Paid	Reimbursements	Profits on Special Inspections	Addition to Fund	Net Cost
January	.....	.....	.....	.....	.....
February	.....	.....	.....	.....	.....
March	.....	.....	.....	.....	.....
April	$ 130.00	.....	.....	.....	$ 130.00
May	184.00	.....	.....	.....	184.00
June	398.00	.....	.....	.....	398.00
July	356.00	.....	.....	.....	356.00
August	188.00	.....	.....	.....	188.00
September	172.00	.....	.....	.....	172.00
October	182.00	.....	.....	.....	182.00
November	122.00	.....	.....	.....	122.00
December	28.00	.....	.....	.....	28.00
Totals	$1,760.00	.....	.....	.....	$1,760.00

Additions to Fund ....
Net Cost of Inspection $1,760.00

RECAPITULATION.

**Gross Cost of Contract House Drain and Water Connection Inspections:
Profit on Special Inspections:
Net Cost of Inspections $1,760.00

**City is reimbursed for all special inspections by the house drain layers for whom such inspections are made.

OF MILWAUKEE.

hat part lying East Av. from the Men- e River South to and ng a part of Town

F. C. Balbi.

Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Total Plumbing Inspections.	Total Drain Inspections
23	11	6	1.64	594	21
14	10	1	2.61	444	101
52	22	2	.86	780	387
114	11	10	.59	842	1288
108	9	11	.56	1038	1682
93	9	14	.75	980	1225
155	16	13	.48	973	1017

TABLE SHOWING BOUNDARY LINES AND NUMBER OF INSPECTIONS MADE IN THE VARIOUS DIVISIONS OF THE CITY OF MILWAUKEE.

Boundary Lines of Districts.	All that part lying East of the Milwaukee River including the Village of East Milwaukee.	All that part bounded South by the Menomonee River, North by Galena St., East by Milwaukee River West to and including a part of Wauwatosa	All that part lying North of Clark St. and West of 20th St.	All that part lying West of 20th St bounded on the South by Galena St. and on the North by Clarke St.	All that part lying North of Galena St. bounded on the East by the Milwaukee River, and on the West by 7th St.	All that part lying North of Galena St. and bounded on the East by 7th St. and on the West by 20th St.	All that part lying West of 11th Av. from the Menomonee River South to and including parts of West Milwaukee, Town of Greenfield and Town Lake.	All that part lying between 1st and 11th Av. from the Menomonee River South to and including a part of Town Lake.	All that part lying East of 1st Av. from the Menomonee River South to and including a part of Town Lake.	RECAPITULATION.
DIVISIONS.	EAST DIVISION.	WEST DIVISION.					SOUTH DIVISION.			
INSPECTORS.	Wm. Smith.	P. J. King.	Edw. Wettig.	A. G. Barsch	L. A. Mehner.	W. G. Nern.	J. J. Horsch.	A. W. Stark	F. C. Balbi.	
MONTHS.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Plumbing Inspected. / Drain Inspected. / Plumbing Rejected. / Drain Rejected. / Cost Per Inspection.	Total Plumbing Inspections. / Total Drain Inspections. / Total Plumbing Rejections. / Total Drain Rejections. / Total Rejections. / Percentage Plumbing Rejections. / Percentage Drain Rejections. / Percentage Total Rejections. / Average Time Minutes Per Inspection. / Average Monthly Cost Per Inspection. / Total Cost Per Month
January	108 31 17 5 .86	68 16 6 3 1.43	65 17 19 ..... 1.46	65 56 9 6 .99	49 14 11 4 1.90	57 16 4 ..... 1.64	76 23 22 ..... 1.21	56 18 5 1 1.62	50 23 11 6 1.64	501 214 808 104 25 129 175 .116 .159 48.4 1 34 $ 1,080.00
February	93 21 11 1 1.05	62 6 8 ..... 1.76	46 5 5 3 2.35	48 5 8 ..... 2.26	46 11 9 1 2.11	21 7 ..... 1 4.20	53 20 10 ..... 1.64	43 12 5 ..... 2.18	32 14 10 1 2.61	414 101 545 66 7 73 .148 .069 .133 55.6 1 98 1,080.00
March	155 67 15 3 .54	113 55 16 ..... .71	90 76 20 8 .72	61 22 9 1 1.45	80 14 20 2 1.28	62 32 11 3 1.28	79 45 4 3 .97	53 24 3 ..... 1.56	87 52 22 2 .86	780 387 1167 120 22 142 .153 .057 .122 41.5 93 1,080.00
April	148 187 20 22 .36	150 138 15 9 .42	82 232 24 24 .38	68 163 12 10 .52	74 109 15 15 .67	65 101 9 2 .72	96 138 11 10 .51	68 111 3 1 .67	91 114 11 10 .59	842 1288 2130 120 103 223 142 .079 .104 29.1 51 1,080.00
May	178 300 27 28 .25	145 120 20 5 .45	103 144 17 11 .49	73 187 7 14 .46	110 314 14 42 .28	79 221 11 15 .40	150 177 25 14 .37	93 111 7 ..... .59	107 108 9 11 .56	1038 1682 2720 137 140 277 .131 .083 .101 25.4 .40 1,080.00
June	180 195 24 32 .32	147 86 16 11 .52	115 222 16 19 .36	62 64 4 4 .95	132 192 38 22 .37	105 126 14 9 .52	61 69 14 2 .92	112 178 5 ..... .41	66 93 9 14 .75	980 1225 2205 140 113 253 143 .092 .114 27. .49 1,080.00
July	106 45 29 4 .79	149 101 9 2 .48	107 172 22 13 .43	78 160 12 7 .50	74 91 11 10 .73	146 122 12 4 .55	119 82 3 13 .60	99 89 6 ..... .64	95 155 16 13 .48	973 1017 1990 120 66 186 .123 .065 .093 28.9 .54 1,0 0 00
August	184 177 13 4 .35	84 53 7 1 .88	126 127 30 8 .47	120 98 20 4 .55	141 151 28 18 .49	108 82 15 6 .63	87 115 11 2 .59	63 29 4 1 1.30	81 93 13 8 .69	994 925 1919 141 52 193 141 .056 .100 30.7 .56 1,080.00
September	158 151 21 6 .39	126 88 22 6 .56	95 65 20 1 .75	60 65 11 4 .94	164 192 30 12 .34	46 39 9 2 1.41	85 114 16 1 .60	99 52 4 ..... .79	25 10 13 ... 3.44	858 776 1634 146 35 181 .170 .045 .110 30.6 .66 1,0 0 00
October	162 170 15 11 .36	108 71 14 6 .67	79 64 13 12 .84	95 189 16 24 .42	105 106 8 3 .57	115 76 14 6 .63	69 60 6 ..... .91	110 117 21 15 .53	881 886 1767 142 82 194 .127 .092 .109 33.9 .61 1,080.00
November	139 124 17 5 .46	108 60 24 7 .71	79 159 12 9 .50	51 149 9 7 .60	78 329 13 41 .29	90 133 13 5 .74	102 115 17 4 .53	86 93 6 ..... .67	101 108 25 14 .75	834 1270 2104 136 92 228 .163 .072 .108 29.8 .51 1,080.00
December	128 34 9 3 .74	57 49 2 ..... 1.13	46 42 12 8 1.36	36 74 7 7 1.09	119 201 20 23 .58	46 24 2 ..... 1.71	76 69 14 4 .83	49 11 1 1 2.00	81 81 18 9 .74	638 585 1223 85 55 140 .133 .094 .114 37.3 .88 1,08.00
Total Plumbing Inspt.	1739	1317	992	801	1162	930	1099	890	926	9856
Total Drain Inspt.	1502	843	1294	1107	1802	1009	1043	788	968	10356
Total Plumbing Reject.	218	159	202	121	225	108	161	55	178	1427
Total Drain Reject.	124	50	109	76	214	50	62	4	103	792
Percentage Plumbing Reject.	.125	.121	.203	.151	.193	.116	.147	.062	.193	.115
Percentage Drain Reject.	.084	.06	.084	.069	.118	.050	.059	.005	.106	.076
Percentage Total Reject.	.106	.097	.136	.103	.148	.081	.104	.035	.148	.110
Average Time Min. Per Inspt.	26.8	34.1	33.2	38.1	19.8	33.4	32.1	41.4	37.9	31.8
Average Cost Per Inspection.	.444	.666	.629	.754	.485	.742	.672	.858	.760	.641
Total Per Year.	3241 342	2160 209	2286 311	1908 197	2964 439	1939 158	2142 223	1678 59	1894 281	20212 2249 $12,960.00

ANNUAL REPORT
of the Superintendent of
PLUMBING AND HOUSE DRAIN LAYING

Milwaukee, Jan. 15th, 1918.

Mr. Percy Braman,
Comm. of Public Works.

Dear Sir:

I respectfully submit herewith the annual report of the Dep't of Plumbing & House Drain laying for the year ending Dec. 31st, 1917. The attached table shows the divisions of the City into nine Districts and the number of men employed.

Respectfully submitted

CON. ZARTNER, Deputy.
GEO. R. STOLZ, Superintendent.

DIVISIONS.	Plans Approved.	Plans Cancelled		Plans Disposed of by Completion and Cancellation						Unfinished Plans.				
		1917	1916	1917	1916	1915	1914	1913	1910	1917	1916	1915	1914	1913
West	1724	12	3	1388	436	10	.....	.....	1	336	7	5	.....	.....
East	459	4	3	388	106	.....	.....	.....	.....	71	5	.....	.....	1
South	1000	9	2	809	171	1	1	.....	.....	131	7	2	.....	2
Town Lake	10	.....	.....	9	2	.....	.....	.....	.....	1	1	.....	.....	.....
Shorewood	117	2	1	74	43	2	.....	.....	.....	13	2	.....	.....	.....
West Milwaukee	22	.....	.....	17	2	.....	.....	.....	.....	5	.....	.....	.....	.....
Town Greenfield	21	.....	.....	16	6	.....	.....	.....	.....	5	.....	.....	.....	.....
Town Wauwatosa	26	.....	.....	18	11	.....	.....	.....	.....	8	.....	.....	.....	.....
Total	3379	27	9	2779	777	13	1	.....	1	630	22	7	.....	3

ORGANIZATION.

Superintendent of Plumbing & House Drains	$ 1,800.00
Deputy Superintendent of Plumbing & House Drains	1,500.00
Nine Field Inspectors	12,960.00
Junior Clerk Stenographer	453.13
Total	$16,713.13

Report of

City Engineer

For the Year Ending

December 31,

January 15th, 1918.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

In compliance with the requirements of the City Charter I herewith submit to you the report of the operations of the Bureau of Engineers for the year ending December 31st, 1917.

BUREAU OF ENGINEERS.

Geo. F. Staal	City Engineer
Ed. F. Leidel	Chief Engineer
Edw. F. Petersik	Chief Clerk
Anne Manion	Junior Clerk Stenographer
James C. Berenson	Senior Engineer
Fred Hornbach	Senior Engineer
Wm. F. Hunt	Senior Engineer
E. L. Knebes	Senior Engineer
J. G. Baumgartner	Junior Engineer
Harry Nelson	Junior Engineer
August Bussian	Junior Engineer
Joseph Richter	Junior Engineer
G. A. Uhlmann	Structural Draftsman
B. P. Schaefer	Structural Draftsman
Geo. Eigner	Draftsman
F. W. Schultz	Draftsman
Jos. Sikorra	Draftsman
Frank Nahrath	Chief Estimate Clerk
Oscar Ludovici	Asst. Estimate Clerk
Fred Bonholzer	Asst. Estimate Clerk
Frank Kaiser	Instrumentman
Leon Glasgow	Instrumentman
Roy Bartos	Rodman
Theo. Gauger	Rodman
Robert Baumgartner	Rodman
Arnold Harbicht	Rodman
Geo. L. Hubbell	Special Draftsman—Track Elevation
Wm. W. Hanus	Structural Draftsman—Track Elevation
J. T. Weldon	Draftsman—River Survey
W. Kuechle	Draftsman—River Survey

STREETS AND ALLEYS.

The length of streets and alleys improved during the year 1917 are as follows:

Streets improved	23.000 miles
Streets paved	19.922 miles
Alleys paved	10.878 miles

The total cost of streets and alley improvements amounted to $1,374,574.86, of which amount $1,034,023.57 was assessed against abutting property as benefits. The improvements made and the cost thereof, are shown by the following statement:

STREET IMPROVEMENTS.

Excavation	98,007.00 cu. yds.	$ 93,142.38
Filling	45,308.00 cu. yds.	32,266.88
Asphalt pavement	193,990.00 sq. yds.	415,194.65
Asphalt top removed	87,401.21 sq. yds.	25,793.22
Asphalt resurfaced	79,064.06 sq. yds.	124,493.67
Sandstone blocks on old foundation	3,673.07 sq. yds.	10,616.08
Binder	47,367.76 cu. ft.	13,262.97
Bituminous concrete pavement	34,054.66 sq. yds.	50,703.21
Brick pavement	10,300.51 sq. yds.	26,227.34
Brick pavement removed	29,839.06 sq. yds.	12,069.72
Brick gutter	14,323.66 sq. yds.	38,881.27
Brick gutter laid flat on old foundation	6,349.09 sq. yds.	9,952.74
Brick relaid	318.83 sq. yds.	239.20
Sandstone block pavement	19,723.67 sq. yds.	71,412.12
Granite block pavement, recut & replaced	8,208.23 sq. yds.	19,925.18
Granite block pavement removed	3,798.34 sq. yds.	666.68
Creosoted wood block pavement	24,371.60 sq. yds.	60,018.74
Cement concrete	3,155.90 cu. yds.	18,300.35
Cement concrete removed	10,811.94 sq. yds.	3,087.90
Stone curb	25,036.30 lin. ft.	22,020.17
Stone curb reset	55,608.71 lin. ft.	8,310.42
Radius stone curb	5,094.15 lin. ft.	5,448.31
Comb. cement curb and gutter (cement)	55,319.89 lin. ft.	32,041.05
Cement curb	5,406.45 lin. ft.	3,083.36
Cement gutter	414.40 lin. ft.	214.32
Cement curb and gutter reset	1,629.90 lin. ft.	468.61
Cement curb and gutter removed	3,287.60 lin. ft.	376.85
Cement sidewalks	353,339.22 sq. ft.	47,390.52
Cement driveway	370.50 sq. ft.	61.13
Cement sidewalk reset	2,361.60 sq. ft.	236.16
Stone gutter removed	1,552.65 sq. yds.	388.17

Stone gutter repaved	872.47 sq. yds.	610.73
Cobblestone pavement removed	2,652.10 sq. yds.	795.63
Cobblestone gutter repaved	174.11 lin. ft.	78.35
Cement risers	30.00 lin. ft.	22.50
		$1,147,800.58

ALLEY IMPROVEMENTS.

Excavation	30,413.10 cu. yds.	$ 32,747.62
Filling	1,137.00 cu. yds.	1,263.90
Bituminous concrete pavement	57,412.40 sq. yds.	80,875.68
Brick gutter	5,828.40 sq. yds.	14,866.24
Cement concrete pavement	28,232.75 sq. yds.	38,346.39
Drain tile	29,459.66 lin. ft.	4,793.54
Brick pavement	10,437.93 sq. yds.	24,320.36
Cobblestone pavement removed	9,043.53 sq. yds.	3,621.38
Asphalt pavement	1,581.48 sq. yds.	3,838.51
Creosote wood block pavement	1,568.48 sq. yds.	4,313.32
Cement sidewalk	22.80 sq. ft.	3.42
		$208,990.36

WORK DONE BY CITY CREWS.

Cement walks	80,629.51 sq. ft.	
Cement curb	162.05 lin. ft.	
Cement driveway	1,977.84 sq. ft.	
Cement walks patched	32.55 sq. ft.	
Cement walks chipped	15.87 sq. ft.	
Cement walks replaced	2,215.20 sq. ft.	$ 17,783.92
Cement walks raised	1,131.60 sq. ft.	
Cement gutter	42.10 lin. ft.	
Comb. cement curb and gutter	35.70 lin. ft.	
Cement radius curb	38.10 lin. ft.	

Grand Total $1,374,574.86

The following streets were paved with asphalt under a contract given by the abutting property owners:

	Sq. Yds.
Hadley street, from E. L. 39th street to E. C. L. Grant Blvd	2,780.00
40th street, from N. L. Hadley street to S. L. Burleigh street	4,600.60
Total length ..... 0.541 miles. TOTAL	7,380.60

Table showing miles of the various pavements taken up and laid during the year 1917, and the total miles of paved streets at the end of the years 1916 and 1917:

Kind of Pavement	Miles taken up during 1917	Miles laid during 1917	Total miles at end of 1916	Total miles at end of 1917
Asphalt	4.37127	14.75201	110.15827	120.53901
Brick	1.36555	0.55142	25.00785	24.19372
Granite Block	0.47349	0.37841	11.22588	11.13080
Sandstone Block	0.	1.22790	8.91384	10.14174
Creosoted Wood Block	0.	1.20568	9.95049	11.15617
Bituminous Concrete	0.	2.43222	6.04242	8.47464
Cement Concrete	0.	0.	0.99601	0.99601
Total	6.21031	20.54764	172.29476	186.63209
Macadam	6.50328	0.	241.77307	235.26979
Grand Total	12.71359	20.54764	414.06783	421.90188

At the end of the year 1916 there were 491.00 miles of streets within the city limits of which 421.902 miles are paved and 69.098 miles are unimproved.

MILES OF ALLEY PAVEMENT.

Total length of alleys paved during 1917	10.87827 miles
Total length of alley pavement removed during 1917	2.14100 miles
	8.73727 miles
Total length of paved alleys at the end of 1916	119.99953 miles
Total length of paved alleys at the end of 1917	128.73680 miles

The following ordinances and estimates have been prepared in the office during the year:

Estimates for improving streets and alleys	200
Ordinances for establishing the grade on streets	55
Ordinances for establishing the grade on alleys	110
Ordinances for establishing the grade of sidewalks	6
Ordinances for establishing the width of sidewalks and roadways	14
	185
Plans for house drain and water services	72
Sketches or plans for street and alley improvements	260
Profiles—establishing grades	327
Certificates issued for street and alley improvements	198

LENGTH OF STREETS.

At the end of the year 1916, the total length of streets in the City of Milwaukee amounted to 490.00 miles.

During the year 1917 there were added:

By annexation	0.00 miles
By platting	.25 miles
By condemnation	.14 miles
By deed	.89 miles
Total of new streets	1.28 miles
Total at end of 1917	491.28 miles

WATER PIPE.

Plans and profiles were made, line and grade given for laying 24,977 feet or 4.73 miles of water pipe of sizes ranging from six to twelve inches in diameter, as follows:

15,643 lineal feet of 6 inch pipe.
4,377 lineal feet of 8 inch pipe.
4,957 lineal feet of 12 inch pipe.

A complete report of the costs of the laying of water pipe, etc., will be found in the report of the Superintendent of Water Works.

VACATIONS AND CONDEMNATIONS OF LAND.

Maps and descriptions of lands proposed to be condemned for highway or other purposes were made, also for the vacations of streets and alleys, as follows:

CONDEMNATIONS.

	Ward
Easement for sewer right of way	15
School site	14
School site	17
School site	24
Seventh street, from Green Bay Ave. to Lake St	21
Elm street, from 45th St. to Lisbon Ave	20
Alley, north and south, Galena, Cherry, W. 24th and 25th St	19
18th street, from Teutonia avenue to Davis St	25
Atkinson avenue, from 6th St. to bet. 9th and 10th Sts	25
Easement for sewer right of way	15
School site	17

School site 24
Mill street, from Green Bay Ave. to Louis Ave..... 25
Auer Ave., from 31st to 32nd St..... 20
Louis Ave., from Somer's Subd. No. 1 to Lake St..... 25
9th Street, from Somer's Subd. No. 1 to Lake St..... 25
Keefe Ave., from Green Bay Ave. to Pt. Washington Rd..... 25
Townsend St., from 24th St. to W. 24th St..... 20
10th St., from Abert Pl. to Lake St..... 25
11th St., from Abert Pl. to Lake St..... 25
12th St., from Abert Pl. to Lake St..... 25
Humboldt Ave., from Keefe Ave. to Lake St..... 21
Lands—widening of S. Menomonee Canal..... 5
School site 17
School site 10
Easement for Martin St.—State St. bridge.....2 & 3
Davis St., from Green Bay Ave. to Pt. Washington Road..... 21
Locust St., from Humboldt Ave. to Milwaukee River..... 21
Folsom Pl., from Milwaukee River to Cambridge Ave..... 18
53rd St., from Pabst Ave. to Vine St..... 19
Alley, north and south—Keefe—Jefferson—4th and 5th St..... 21
Alley, north and south—Keefe—Jefferson—5th and Pt. Washington Rd... 21
4th St., from Keefe avenue to Vienna Avenue..... 21
5th St., from Keefe avenue to Vienna avenue..... 21
Vienna avenue, from 4th St. to Pt. Washington Rd..... 21
Marshall St., from Wisconsin St. to Lake St..... 3
Pease St., from 22nd to 25th St..... 20
Jones Island, Old Harbor Entrance to Wilcox St..... 5
Government breakwater—reopening gap..... 1
Portion of Walker St., bet. Blks. 94 and 97 Week's Subd..... 5
Oklahoma Ave., from Lake Michigan to west city limits.....14 & 17
Lake street, from Milwaukee river to west city limits.....21-25-20

VACATIONS.

Walker St., from Barclay St. to C. M. & St. P. R. R. right of way..... 5
Alley, north and south, Concordia-Auer, W. 24th and 25th St..... 20
Pine St., from Montana St. to N. line Lot 1, Blk. 1, Burnham Hts..... 17
N. Cambridge Ave., from Thomas Ave. to Bradford Ave..... 18
Alley, Block 19 Milwaukee proper..... 6
Alley, Block 16 Milwaukee proper..... 6
Alley, Block 20 Milwaukee proper..... 6
Ship St., from Cape St. to Green Bay Canal..... 6
Ziemer St., from Becher St. to Lincoln Ave..... 12
55th St. from Vine St. to 72.72 ft. north..... 19
54th St. from Vine St. to 72.72 ft. north..... 19
Alley—52nd, 53rd, Galena, Vliet St..... 19
31st St., from Concordia Ave to Townsend St..... 20
Alley, east and west, 31st, C. M. & St. P. Row, Concordia, Townsend.... 20

Alley, north and south, 35th, 36th, Center and Hadley Sts	20
Alley, north and south, W. 24th, 25th, Concordia, Auer Ave	20
Concord Ave., from Oakland Ave. to pt. 120 feet east	18
Alley, 9th, 10th, Galena, Central Ave	9

STREET NAMES CHANGED DURING 1917.

Former Street Name	New Street Name	Ward
Terrace Place	Back Bay	1
Roadside Lane	State Street	15
Wegner Place	Linebarger Terrace	17
O'Neill Street	West 19th Street	25

AREA OF CITY.

January 1st, 1918	25.85	square miles
Land	25.332	square miles
Water	0.518	square miles

	Sq. Miles
The area of the city January 1st, 1900	21.15
The area of the city January 1st, 1905	22.37
The area of the city January 1st, 1910	22.63
The area of the city January 1st, 1915	25.72
The area of the city January 1st, 1916	25.85
The area of the city January 1st, 1917	25.85

SEWERS.

Contracts for work completed during the year included 38,499 lineal feet of 8, 12, 15 and 18 inch cement or clay pipe sewers; 8,403 lineal feet of 21, 24, 27, 30 and 36 inch reinforced concrete pipe sewers and 763 lineal feet of 42 and 72 inch monolithic concrete sewers and 810 lineal feet of 42 inch brick sewer.

The Sewer Department, in addition to the flushing and cleaning of sewers, repairs to and setting to grade of manholes, built 9 manholes and 936 catch basins during the year. In addition to the sewers laid and accepted during the year 1917, amounting to 9.181 miles at a cost of $150,589.60, there were laid 1,076 lineal feet of 12-inch pipe sewer by the Bureau of Sewers.

Up to the end of 1916 there were built 498.475 miles of sewer at a cost of $7,303,241.43, making at the end of 1917 a total of 507.655 miles at a cost of $7,453,831.03.

The total length of sewers, including intercepting sewers, con-

structed by the City of Milwaukee up to the end of the year 1917, was 507.655 miles, as follows:

4.567 miles of 8 and 10 inch pipe.
183.866 miles of 12 inch pipe.
175.538 miles of 15 and 18 inch pipe.
0.734 miles of 21 inch pipe.
1.393 miles of 24 inch reinforced concrete pipe.
0.635 miles of 27 inch reinforced concrete pipe.
1.481 miles of 30 inch reinforced concrete pipe.
1.220 miles of 36 inch reinforced concrete pipe.
0.262 miles of 48 inch reinforced concrete pipe.
0.014 miles of 54 inch reinforced concrete pipe.
14.083 miles of 24 inch brick.
42,926 miles of 30 inch brick or monolithic concrete.
19.217 miles of 36 inch brick or monolithic concrete.
9.689 miles of 42 inch brick or monolithic concrete.
8.994 miles of 48 inch brick or monolithic concrete.
5.495 miles of 54 inch brick or monolithic concrete.
6.503 miles of 60 inch brick or monolithic concrete.
4.220 miles of 66 inch brick or monolithic concrete.
6.458 miles of 72 inch brick or monolithic concrete.
2.465 miles of 78 inch brick or monolithic concrete.
2.754 miles of 84 inch brick or monolithic concrete.
0.125 miles of 90 inch brick or monolithic concrete.
3.397 miles of 96 inch brick or monolithic concrete.
2.718 miles of 120 inch brick or monolithic concrete.
9.295 miles of intercepting sewer (excluding intercepters built by Sewage Commission).

The largest diameter of sewer built is 120-inch and the smallest diameter is 8-inch. There are 89 outlets for sewers into the Milwaukee, Menomonee and Kinnickinnic rivers and four outlets into Lake Michigan. These sewers have 23,613 manholes and 24,293 catch basins; there are also 76,722 house drains connected with the sewers and 237 storm drains. All work completed during the year, including laying of sewers, water pipe, house drains and water services, has been entered on the proper departmental records.

LAKE LEVELS.

The following tables, made up from the daily records, show the stages of water levels of the lake and rivers for each month of the year, and the means and extremes since the year 1896. These elevations refer to the city datum line as a base.

STAGE OF WATER IN RIVERS AND LAKE DURING 1917.

Month	Highest	Lowest	Mean
January	+0.3	—0.8	—0.423
February	—0.1	—0.6	—0.386
March	+0.2	—0.6	—0.274
April	+0.3	—0.5	—0.064
May	+0.7	—0.1	+0.040
June	+3.0	0.0	+0.653
July	+1.5	+0.6	+0.862
August	+0.8	+0.2	+0.501
September	+1.3	0.0	+0.452
October	+1.3	—0.1	+0.058
November	+0.2	—0.4	—0.035
December	+0.1	—0.7	—0.347

Highest	+3.0
Lowest	—0.8
Average Mean	+0.0864

Year	Highest	Lowest	Mean
1917	+3.0	—0.8	+0.0864
1916	+0.4	—1.1	—0.349
1915	0.0	—1.2	—0.6105
1914	+0.2	—1.5	—0.489
1913	+0.3	—1.5	—0.6119
1912	+1.7	—2.9	—0.7939
1911	—0.6	—2.9	—1.809
1910	—0.3	—2.6	—1.497
1909	+0.8	—3.0	—0.242
1908	—1.1	—1.5	—0.482
1907	+1.0	—1.1	+0.960
1906	+1.1	—0.9	+0.070
1905	+1.0	—1.2	—0.020
1904	+1.5	—1.36	—0.140
1903	+0.23	—1.73	—0.660
1902	0.0	—2.2	—1.010
1901	+0.4	—1.9	—0.690
1900	—1.1	—2.3	—0.940
1899	+0.4	—2.2	—0.900
1898	0.0	—2.7	—0.980
1897	—0.1	—2.3	—1.160
1896	—1.1	—2.8	—1.810

TRACK ELEVATION AND DEPRESSION.

Track elevation on the south side, between Greenfield avenue and the Menomonee river and between Florida street and Reed

street, has been finally completed. This work eliminates one of the most dangerous grade crossing districts in the city.

The Railroad Commission, by a recent order, extended the time for the commencement of the grade separation on the northwest side making it obligatory on the part of the Chicago, Milwaukee and St. Paul railway to start work not later than May, 1918.

An order was issued by the railroad commission providing for a separation of the grades on the so-called "Beer Line" at North avenue.

LINNWOOD AVENUE INTAKE SYSTEM.

Extension of the Linnwood Avenue Intake Tunnel.

Since January 1st, 1917, the following progress has been made: 1,561.8 lineal feet of excavation and 1,685.8 lineal feet of completed arch and sidewalls combined. The above named operations were completed on July 11th, 1917, in a period of 173 working days or an average of 9.7 feet per day. The installation of the invert started on July 13th, 1917, and was finished September 13th, 1917, in a period of 53 working days, or an average of 47.0 feet per day. The total length of the tunnel is 6,493.3 feet of which 4,013.7 feet was constructed by Jos. Hanreddy and 2,479.6 feet by the Wm. J. O'Brien Construction Company.

The cost of the extension to date, exclusive of non-contract extras is $364,033.19. During 1917, $271,273.11 represented the total money earned by the contractor, of which sum $230,582.07 have been paid him. The average contract cost of the tunnel per lineal foot is $146.81.

The final report of the U. S. Bureau of Mines, based on inspection made October 3rd, 1916, was received and one of the chief recommendations made was "That a steeper gradient be employed in driving the tunnel, which will carry the tunnel down approximately parallel with the slope of the lake bed and reach a point about 30 feet deeper at the terminus than was contemplated, making the depth at the terminus at least 150 feet below the surface of the lake."

This change of grade was complied with, the total being 1,013.3 lineal feet at $37.86 per foot, which amounted to $38,363.54.

The concrete backing averaged 0.52 cu. yds. per lineal foot and amounted to $4.19. The cost of engineering and inspection amounted to $11,295.27, which averaged $4.56 per lineal foot, which,

added to the average contract cost, bring the average cost per lineal foot of tunnel to $151.37.

The average daily mining progress for arch and sidewalls varied from 2 to 16 lineal feet. The monthly progress in excavation varied from a minimum of 214.0 to a maximum of 346.5 lineal feet. The maximum volume of shale excavated per month was 260.0 and the minimum 160.0 cu. yds.

The average monthly progress in concreting varied from 232.0 to 348.7 lineal feet of sidewalls and from 207.7 to 324.3 lineal feet of arch. The minimum volume of concrete placed any one month was 505.0 cu. yds. and the maximum 777.0 cu. yds. All of the concrete was mixed in a ½ cu. yd. Smith mixer.

The purity of the tunnel air was maintained on a high standard at all times. The city's inspectors made hourly tests with safety lamps for the presence of methane. An additional precaution was taken by securing three samples of tunnel air daily which were analyzed in the field office for carbon dioxide and the amount of oxygen. The drilling of one 10 to 12 foot test hole on each shift was continued to the completion of the head and bench mining operations. These test holes were driven as advance explorations to ascertain the condition of the material in advance of the face and also to warn the drillers of the presence of water in advance of the face.

The amount of inflow of water ran from a minimum of 85,000 gals. per 24 hours to a maximum of 120,000 gals. per 24 hours. Of the total inflow, 5% was shaft seepage, 38% from Station 0+49 to Station 25+00, 42% from Station 25+00 to Station 40+13.7, or a total of 80% in the first 4,000 lineal feet and 15% in the extension. At no time during the construction of the extension did any inflow occur which was to any degree alarming or even threatening.

Beginning with October 9th, 1917, the tunnel was allowed to begin to fill up east of Station 54+80. On November 12th, 1917, the shaft pumps were removed and since then all inflow was allowed to accumulate in the tunnel. On November 15th, 1917, the shaft was covered and all but one laborer laid off. This condition will exist until the lake crib sub-contractor resumes operations, when the contractor will begin operations for de-watering the tunnel and complete various delayed items.

The city's organization consisted of five construction inspectors, two engineers inspectors, one draftsman and one resident engineer. The contractor's organization consisted of one superin-

tendent, two general foremen and three heading foremen, three mining crews and one concrete crew.

One life was lost in the entire construction of the Intake System, thus far, and that after the mining the concreting operations were completed. One of the contractor's laborers, while removing hoisting equipment, fell into the shaft, which resulted in his death. Miscellaneous minor accidents to some of the men had occurred, which are hardly worthy of mention, and it is gratifying to note that the loss to human life has been so little.

Linnwood Avenue Tunnel.

A survey for the proposed extension of this tunnel, from the shore shaft to the west line of the Milwaukee river, along Linnwood avenue, has been made during the summer. On December 7th, 1917, a contract has been let to Mr. Henry Knaack for making test borings in Linnwood avenue, along this proposed line, at and for the price of $2.25 per lineal foot. This work is expected to be finished in two months.

Submerged Lake Crib and Shaft.

Work, attendant the removal of the steel crib from its location over the tunnel at Station 25+00, was commenced July 18th, 1916. The concrete ballast in the crib was removed by light ballasting, an average force of 16 men being employed by Greiling Bros. subcontractors to the Wm. J. O'Brien Construction Co. About 37 feet of concrete were removed by October 26th, 1916, at which time operations were concluded for the year, leaving about 12 feet of concrete to be removed during 1917.

The construction of the wooden submerged crib was then started at Greiling's dock, along the Kinnickinnic river, and completed except for the screen, on April 1st, 1917. The crib is a regular octagon in plan, 86 feet, 7 inches long diameter, 80 feet, 0 inches short diameter and 12 feet in height. The opening for the lake shaft is 18 feet in diameter. No concrete was removed from the crib until June 1st, 1917, because of a strike of tug-boat men. During the removal of the remaining concrete, the completed submerged crib was launched into the Kinnickinnic river, towed to a slip south of Greenfield avenue, and the wooden superstructure to carry the steel crib was erected thereon. The depth of water at the end of the

tunnel necessitated a superstructure to raise the steel crib sufficiently above the lake level for protection against waves. The superstructure was 11 feet in height, built of 12″x12″ timbers as per plan of the submerged crib below it and required about 122 M ft. B. M. of timbers. On August 10th, 1917, the submerged crib and superstructure were towed out and successfully placed in position over the end of the tunnel at Station 65+00, total time of placing being but two hours. Five unsuccessful attempts had previously been made, but were abandoned because of heavy swells or strong currents. A few days later the steel crib was removed from its former location and placed upon the superstructure above the submerged crib. The crib as placed showed a side of 15 feet above water. About 300 tons of stone were placed in the steel crib to act as ballast. On August 27th, the wooden caisson was completed and locks closed and the water was then pumped out from below the deck of the steel caisson. The cutting edge sank 4.5 feet the first day and continued gradually until a depth of 7.5 feet was obtained on August 30th. The upper dam was then pumped out, the locks opened and the water beneath the deck removed. A perfect seal in the hard clay bottom was the result. Excavation was at once started. On the morning of September 9th, an average depth of 21 feet of timbering and 22.5 feet of excavation was reached. From September 1st to 9th, stormy weather on the lake was the rule. The week's storm culminated in a heavy blow on September 10th and a heavy sea from the northeast and southeast set the crib vibrating at 3 p. m. The vibration lasted until midnight when the superstructure crushed and the steel crib tilted to the southwest so that the lower side was but 2 feet above lake level. No doubt the steel caisson inside the crib prevented the steel crib from turning over in the 67 feet of water. Waves 25 feet high were reported by the inspector, which is greater than any so far reported on the lakes. The difficult work of rescuing the 32 men aboard the crib was successfully undertaken by Capt. Bebeau with the tug Boutin at 2 a. m. in the heaviest sea of the year. That no lives were lost is a miracle. Work on the lake shaft was abandoned for the year. On September 17th, the steel crib was pumped out and towed toward the harbor, but more concrete had to be removed before the crib could be brought behind the Government breakwater, standing 26½ feet above water and protected by an anchor light. Divers reported the steel caisson and the submerged crib undamaged. Work will be resumed by Greiling Bros. in May, 1918.

River Survey.

During the past year the survey of the Rivers and Harbors was extended to the Kinnickinnic river and its canals. The survey located existing dock lines, together with the bounding street lines and adjoining improvements along the west bank of the Milwaukee river, south of the harbor entrance, likewise, both banks of the Kinnickinnic river as far south as the Chicago and Northwestern Railway bridge, Chicago Division. A separate survey was made of the lands south of the old harbor entrance extending to Wilcox street and bounded westerly by the Kinnickinnic basin and easterly by Lake Michigan. This necessitated the re-running of an old survey of these lands made by the Government in 1902.

The field work of these surveys was completed and also the computations which permits the drawing of the maps immediately.

During the course of the year, several independent surveys were made, involving the inner harbor and the Milwaukee and Menomonee rivers. The latter were used for the construction of new docks and for proposed changes to existing established dock lines. The most difficult of these surveys was the cross-sectioning of a breakwater in the inner harbor, to be used for park purposes, between Wisconsin street and the harbor entrance.

FINANCIAL.

BUREAU OF ENGINEERS—CITY ENGINEER.

Budget appropriation	$ 4,667.00

EXPENDITURES.

Personal service	$ 4,226.67	
Office supplies	101.37	
Municipal garage service	135.04	
Postage	25.00	
Street care fare	5.00	
Official bond	25.00	
Office equipment	96.58	
	$ 4,614.66	
Unexpended balance	52.34	
	$ 4,667.00	

BUREAU OF ENGINEERS—ENGINEERING DIVISION.

Budget appropriation	$40,775.00
Service vouchers (Water Department)	851.19
	$41.626.19

EXPENDITURES.

Personal service (permanent)	$29,704.91	
Personal service (temporary)	1,407.26	
Office supplies	325.89	
General supplies	945.41	
Minor apparatus	146.40	
Tools	18.77	
General materials	.50	
Minor repairs	44.50	
Municipal garage service	1,870.17	
Postage	20.00	
Storage of vehicles	218.00	
Street car fare	120.00	
General service	342.29	
Office equipment	1,128.01	
	$36,292.11	
Unexpended balance	5,334.08	
	$41,626.19	

RECAPITULATION.

City Engineer, budget	$ 4,667.00	
Engineering Division, budget and vouchers	41,626.19	
		$46,293.19
City Engineer, expenditures	$ 4,614.66	
Engineering Division, expenditures	36,292.11	
	$40,906.77	
Bureau of Engineers, balance	5,386.42	
	$46,293.19	

I wish to express my appreciation to the employes of this department for the services rendered during the past year. While eleven members of the department have enlisted in the National Army it has handicapped us in the work at hand to a considerable extent. Nevertheless, the progress made has been very satisfactory.

Respectfully submitted,

GEO. F. STAAL,
City Engineer.

Annual Report

of

Bureau of Power Plants
Flushing Stations

For the Year

1917.

THOMAS McMILLAN,
Chief Engineer of Power Plant

Mr. Percy Braman,

Deputy Commissioner of Public Works.

Dear Sir:

I herewith report the operations of the several Power Plants for the year ending December 31st, 1917.

MILWAUKEE REFUSE INCINERATOR.

Joseph E. Roddy, Superintendent.

The steam generated in the boilers at the Incinerator was below the normal quantity, owing to the decrease of mixed refuse received at the plant; being 7,295.39 tons less than the previous year. Garbage alone showed a decrease of 5,608.01 tons, by the conservation of food products; being less than any year since the construction of the present Refuse Incinerator.

During the year an extended furnace was constructed in front of our boiler to fire fuel direct and obtain a higher degree of temperature on the heating surface of the boiler. The results are satisfactory, a more uniform pressure of steam can be obtained to furnish power to operate the Milwaukee River Flushing Station, and prevent the offensive odor eminating from the river and eliminate complaints. It is intended at an early date, to equip another boiler with a similiar furnace so that one boiler may be fired direct at all times.

TOTAL COST OF OPERATION AND MIXED REFUSE INCINERATED.

YEAR	Total Tons Mixed Refuse Incinerated	Total Cost Including Equipment	Total Cost of Equipment	Total Cost of Operation Only	Cost Per Ton
1911	50,803.39	$57,419.47	$5,056.45	$53,363.02	$1.05
1912	48,413.32	56,760.51	3,580.74	53,179.77	1.10
1913	53,581.02	66,147.30	4,269.31	61,877.99	1.15
1914	54,684.15	67,892.43	1,365.48	66,526.95	1.22
1915	58,043.10	66,812.56	3,695.40	63,117.16	1.09
1916	54,275.36	67,613.10	3,374.64	64,238.46	1.1835
1917	46,979.97	75,921.82*	3,842.75	72,079 07	1.534

*Equipment includes extending of furnace, paving roadway and bath building.

STATEMENT SHOWING TOTAL REFUSE INCINERATED. CITY AND PRIVATE COLLECTIONS DURING 1917 AND FEED WATER PUMPED TO BOILERS.

MONTH	Total Hours Operated	Total Pounds Mixed Refuse Incinerated	Cubic Feet of Water to Boilers	Temperature of Water to Boilers	Average lbs. of water per hr. to Boilers	Average Evaporation per pound of Mixed Refuse
January	680	7,382,320	72,279	180	6,439.20	1.685
February	608	6,316,100	65,307	180	6,507.06	1.596
March	680	6,867,720	73,534	180	6,551.81	1.541
April	656	6,997,300	83,790	180	7,737.80	1,378
May	680	6,837,360	84,497	180	7,527.68	1.335
June	656	9,153,040	81,486	180	7,525.03	1.854
July	664	8,519,520	85,172	180	7,770.66	1.651
August	680	9,438,660	97,511	180	8,687.08	1.597
September	632	8,368,740	90,375	180	8,662.84	1.528
October	680	9,331,680	78,368	180	6,981.66	1.948
November	648	7,413,120	72,672	180	6,793.93	1.683
December	640	7,334,380	68,375	180	6,472.12	1.770
Totals	7,904	93,959,940	953,375	180	7,307.11	1.626

Average percentage of refuse incinerated during 1917: Garbage, 68.84%; ashes, 26.49%; rubbish, 4.49%; manure, 0.17%.

INCINERATOR POWER PLANT—1917.

Thomas Coughlin, Engineer in Charge.

The Power Plant equipment is the same as noted in previous years. The power delivered in 1917 from the Incinerator Power Plant to operate the Milwaukee River Flushing Station was as follows:

MONTH	Total Hours Operating Flushing Station	Average K. W. Operating Flushing Station	Total K. W. H. delivered to Flushing Station
January	10.35	330	3,465.50
February	.....	.....	.....
March	.....	.....	.....
April	174.00	340	59,160.00
May	96.45	340	32,895.00
June	94.20	340	32,072.20
July	261.50	330	86,404.20
August	358.20	330	118,248.90
September	324.25	330	107,057.20
October	180.40	330	59,606.80
November	49.40	340	16,884.40
December	.....	.....	.....
Totals	1,550.35	334.4	515,794.20

The 600 K. W. Steam Turbine was examined during the early part of the year and found in good operating condition, only minor repairs being necessary.

MILWAUKEE RIVER FLUSHING STATION.

David E. Cameron, Engineer in Charge.

Total hours in operation—flushing.....1,536.35
Total K. W. H. delivered.....417.111
Total cu. ft. of water displaced.....3,774,066,225
Total gallons of water displaced.....28,231,974,103
Average head of water in feet.....2.57

The operation of the machinery was satisfactory during the year.

An air cooling fan was added to the equipment during the early part of the year, suitably connected with air pipes to keep the

motor cool, which worked very satisfactory and kept the temperature normal when in operation.

The wheel pit was pumped out, the wheel examined and found in good condition.

The slate roof of building was repaired and renewed where necessary.

The Station, Buildings and Equipment are now in good operating condition.

JONES ISLAND FLUSHING STATION—1917.

Joseph P. Rafenstein, Engineer in Charge.

The operation of the boilers and machinery at this station were in connection with the Sewerage Commission Testing Station. The main pumping engine, which had been in service for a period of thirty-three years, was out of service in March, the excavation for the tunnel and other experimental work causing the foundation to settle, and all pumping from that date was done by a temporary centrifugal pump furnished by the Sewerage Commission for experimental purposes, as required by them. The boilers were operated to furnish light and heat, and such other motors for experimental work, as required. The men employed ran the three regular shifts in the care and upkeep of such motors and other machinery required.

KINNICKINNIC RIVER FLUSHING STATION—1917.

Ernest C. Eggebrecht, Engineer in Charge.

Total hours in operation	7,394.55
Total cu. ft. of water displaced	11,256,524,000
Total gallons of water displaced	84,204,641,655
Average head of water in feet	2.257
Total coal consumed in pounds	2,605,250

The machinery at this station is in good operating condition, only minor repairs being necessary during the year. The wheel pit was pumped out and wheel and bearing found in good condition. The boilers required minor repairs only in setting and furnaces. The boilers were equipped with new superheaters during the early part of the year.

The building and equipment are now in good operating condition.

Respectfully submitted,

THOMAS McMILLAN,
Chief Engineer of Power Plants.

ANNUAL FINANCIAL REPORT OF THE BUREAU OF POWER PLANTS FOR THE YEAR 1917.

	Incinerator	Incinerator Power Plant	Jones Island Station	Kinnickinnic River Station	Milwaukee River Station	McKinley Park	Milwaukee River Dam	TOTALS
Personal Service (permanent)	$62,409.00	$ 3,960.00	$14,485.15	$12,200.00	$ 8,229.68	$.....	$.....	$101,283.83
Personal Service (temporary)	.....	.....	.....	.....	.....	1,170.48	.....	1,170.48
Cleaning and Disinfecting Supplies	12.17	.....	13.87	6.45	8.93	.....	.....	41.42
Fuel	2,403.03	.....	8,663.09	7,519.70	442.30	.....	.....	19,028.12
Medical and Laboratory Supplies	7.20	.....	.....	.....	2.51	.....	.....	9.71
Office Supplies	21.29	.....	.....	9.00	2.06	.....	.....	32.35
General Supplies	671.79	25.88	246.19	331.28	114.73	.....	.....	1,389.87
Minor Apparatus	4.50	.....	.....	28.44	.....	.....	.....	32.94
Tools	52.56	.....	2.41	.....	.24	.....	.....	55.21
General Materials	737.33	22.87	60.26	384.84	59.37	143.32	.....	1,407.99
General Repairs	2,688.18	149.32	29.33	20.15	208.16	64.43	.....	3,159.57
Minor Repairs	29.70	.....	21.68	.....	.....	.....	.....	51.38
Team Hire	569.18	.....	.....	.....	.....	407.25	.....	976.43
Telephone	10.15	.....	72.00	93.60	49.66	.....	.....	225.41
Water	2,334.94	.....	265.10	231.33	.....	282.06	.....	3,113.43
General Service	128.05	.....	17.50	40.00	1.63	.....	.....	187.18
Advertising	.....	.....	.....	29.38	.....	.....	.....	29.38
General Equipment	625.00	.....	.....	539.23	381.54	.....	.....	1,545.77
Total Operating Expenses—1917	$72,704.07	$ 4,158.07	$23,876.58	$21,433.40	$ 9,500.81	$ 2,067.54	$.....	$133,740.47
Spec. Paving Expense	1,000.00	.....	.....	.....	.....	.....	.....	1,000.00
Spec. Shower Bath Building	2,217.75	.....	.....	.....	.....	.....	.....	2,217.75
Total Expenses	$75,921.82	$ 4,158.07	$23,876.58	$21,433.40	$ 9,500.81	$ 2,067.54	$.....	$136,958.22
Budget Appropriation	$87,892.00	$ 4,200.00	$28,582.00	$20,595.00	$24,833.00	$ 2,678.00	$250.00	$169,030.00
Mar. U. S. Government Current	.....	.....	12.50	.....	.....	.....	.....	12.50
	$87,892.00	$ 4,200.00	$28,594.50	$20,595.00	$24,833.00	$ 2,678.00	$250.00	$169,042.50

Report of

Bureau of Illumination Service

For the Year

1917.

March 27, 1918.

Mr. Percy Braman,
Deputy Commissioner of Public Works.
Milwaukee, Wis.

Dear Sir:

We are handing you herewith report of the Bureau of Illumination Service for the year ending December 31st, 1917.

The year 1917 has been one of marked activity for the Bureau in the way of receiving materials on contract and the installation of such materials by Bureau employees, with the exception of the contract for installing 1,200 15-inch lighting units by a contractor.

We have endeavored to take care of all emergency lighting conditions in viaducts and streets and have also done much to improve and maintain the service supplied all street lights, both gas and electric, even with the limited number of employees in the original organization. Now, that we are reorganized and have an organization in keeping with the demands made upon the Bureau, we can materially improve the service given and increase the installing capacity to a point where it will make a noticeable impression.

During the last year the Bureau has reported to the Electric Company 2,518 lamp outs on their old arc system for which we have deducted from their monthly bills $453.24. There have been 7,200 lamp outs on the Gas and Gasoline system for which we have deducted $550.87. On all the present City owned and operated lights there have been 378 lamp outs, many which were only fractional night outages, the burnt out lamps being replaced the following day.

The following tables give the amounts and cost of the various contracts and work done for the year:

Item	Amount contracted for	Amount received	Amount of contract
Cable	1,223,000 ft.	1,223,000 ft.	$190,354.00
Concrete Posts	8,302	1,800	
Concrete Brackets	2,750	20	235,030.00
Glassware	9,350	9,350	39,417.00
Transformers	3,404	1,445	35,306.72
Harps and Fittings	3,352	2,500	28,447.60
Fixtures	9,250	835	59,900.00

A list of the materials installed during the last year is given below which included that done by Contractor and Bureau employees:

Kind	Amount	Cost
15 foot harp units	1,410	$40,700.00
Pipe street crossings	8,000 ft.	2,900.00
Cable	20,760 ft.	5,190.00
Subway units complete	66	1,500.00
Subway units temporary	10	75.00
300 Watt Emergency	12	250.00
30 ft. concrete posts—2 light units	15	345.00
Total		$50,960.00

The total summary of the above tables is as below:

Item	Cost
Cable	$190,354.00
Concrete Posts, Shafts and Brackets	235,030.00
Refractors	39,417.00
Transformers	35,303.72
Harps	28,447.60
Fixtures	59,900.00
Lamps	10,000.00
Installation	50,960.00
Miscellaneous	52,000.00
	$701,415.32

We wish to draw your attention to the fact as you have no doubt noted in the foregoing tables that we have $701,415.32 of material and that we have $291,296.26 for installation purposes after miscellaneous labor and materials are paid for. This amount is entirely inadequate to consider in connection with work of this magnitude, so it is imperative that we have the use of the issue of the bonds as asked for, namely $250,000.00 to be dated Jan. 1, 1918, and $250,000.00 to be dated July 1st, 1918. With the proceeds of these bonds available we may proceed with the letting of contracts for the installation of the material now on hand in such quantities as will decrease the cost of such installations and give the citizens the use of the materials they have already bought, paid for, and is now in storage.

Wish to call your attention to our office quarters, which at present are the worst in the building i. e., one small office on the west side of the open court and one on the east side, neither large enough to have sufficient space for the employees. This is very inefficient and annoying to us and we recommend that a rearrangement of office space be effected whereby this condition is eliminated, so as to increase the efficiency of all and make the accommodation such as they should be.

CONSTRUCTION DIVISION.

STATEMENT OF REVENUES, EXPENDITURES AND RESERVES.

Year Ending December 31st, 1917.

REVENUES.

Jan. 1st, 1917—1916 Balance—Unencumbered	$276,814.17	
1916 Balance—Reserve for Contracts	389,989.77	
1916 Balance—Reserve for Purchase Orders	4,488.21	
		$671,292.15
Oct. 10th, 1917—Proceeds from sale of bonds		250,000.00
Miscellaneous Credits:		
February Accounts Receivable	$ 19.45	
March Accounts Receivable	27.33	
June Accounts Receivable	4.83	
July Accounts Receivable	7.79	
October Accounts Receivable	47.32	
November Accounts Receivable	23.80	
December Accounts Receivable	6.56	
Service Transfer Voucher Credits	729.69	866.77
TOTAL REVENUES		$922,158.92

EXPENDITURES AND RESERVES.

	Expense	Reserves
Salaries, materials and supplies	$ 47,428.89	
Reserves for Contracts, Jan.1..$389,989.77		
New Contracts and Adjustments 183,748.30		
Total Reserves $573,738.07		
Less payments made thereon... 305,452.13	305,452.13	
Reserves for Contracts, Dec. 31st		$268,285.94
RESERVES FOR PURCHASE ORDERS, Dec. 31st		4,695.70

RESOLUTION RESERVE:			
File No. 12416 — Salary of Engineer	$ 5,000.00		
Less Payments made thereon	2,700.00	2,700.00	
Balance, Dec. 31st			2,300.00
TOTALS		$355,581.02	$275,281.64
EXPENDITURES	$355,581.02		
RESERVES	275,281.64		
Total Expenditures and Reserves			$630,862.66
UNENCUMBERED BALANCE, December 31st, 1917 (Carried to January 1st, 1918)			291,296.26
Totals—Expenditures, Reserves and Balance			$922,158.92

DIVISION OF MAINTENANCE AND OPERATION.

STATEMENT OF EXPENSE, RESERVES AND ABATEMENTS.

Year Ending December 31st, 1917.

STREET LIGHTING—OPERATION.

General Expense, including electric current, salaries, supplies, etc. Auditorium Lights, and lighting of Safety Isles		$268,235.47	
RESERVES for 1918:			
Reserves for Purchase Orders	$7,167.04		
Reserves for Contract, Dec. 31 Balance	7,950.75		
Total		15,117.79	
TOTAL CHARGES			$283,353.26
RESERVES for 1917:			
Reserves for Purchase Orders	$3,767.09		
Miscellaneous	3,405.24		
		7,172.33	
MISCELLANEOUS CREDITS:			
Accounts Receivable		132.43	
TOTAL CREDITS			7,304.76
NET EXPENSE for the year 1917			$276,048.50

HOWARD F. ILGNER,
Illuminating Engineer.

WILLIAM W. RUMSEY,
Engineer Const. and Maintenance.

Report of

Water Works

For the Year Ending

1917.

MILWAUKEE WATER WORKS

*Deputy Commissioner of Public Works

PERCY BRAMAN

Superintendent of Water Worsks

Henry P. BOHMANN

City Engineer

GEO. F. STAAL

Thos. McMillan.....Chief Engineer of Power Plants.
Ferdinand Krieger..Assistant Chief Engineer of Power Plants.
William Kunz.....Engineer in charge of North Point Pumping Station.
William Bormann...Engineer in charge of High Service Pumping Station.
John Koch.....Superintendent of Distribution.
Ferd. E. Fitz.....Assistant Superintendent of Distribution.
Frank J. Murphy....Superintendent of Meters.
Oswald J. Ronge....Chief of Collection Division.
Arthur J. Conaty....Chief Accountant (General Office).
George J. Roderer...Keeper of Pipe Yard.
A. E. Kienth.....Water Chemist.

Committee on Water Works

ALD. GEORGE T. GREDE, Chairman

ALD. STORMY S. THOMPSON ALD. AUG. W. STREHLOW

ALD. JOHN DOERFLER, JR. ALD. JOHN W. RADKE

*On Sept. 30, 1917, Mr. Fred G. Simmons resigned as Commissioner of Public Works. No successor being appointed, the Deputy Commissioner under the City Charter assumed the duties of the Commissioner of Public Works.

REPORT OF SUPERINTENDENT

OFFICE OF SUPERINTENDENT OF WATER WORKS
CITY HALL

Milwaukee, January 25, 1918.

Mr. Percy Braman,
Acting Commissioner of Public Works.

Dear Sir:

I respectfully submit herewith the annual report of the Water Works for the year ending December 31, 1917.

The following is a condensed statement of the revenues and expenditures of the department for the year 1917.

FINANCES.

Operating revenues (water only)		$1,031,931.27
Operating expenditures	$384,497.21	
Depreciation	109,324.74	493,821.95
		$ 538,109.32
Quasi operating revenues	$ 50,974.42	
Quasi operating expenditures	35,609.15	15,365.27
Non-operating revenue		21,202.30
Financial revenue		100.00
Gross income		$ 574,776.89
Deduction from above—Interest on bonded debt		10,800.00
Net income		$ 563,976.89

DISPOSITION OF NET INCOME.

Transfer to general city fund	$200,000.00	
Transfer to unreserved proprietary interest	363,976.89	
		$ 563,976.89

Total amount expended for new construction work and outlays during the year was $405,259.16.

Total proprietary interest, December 31, 1917	$9,576,545.11
Cost of Water Works, less depreciation	8,906,170.87
Bonded indebtedness, less sinking fund on hand	225,000.00

BALANCE SHEET.

ASSETS.

Fixed Assets—		
Property and Plant, less depreciation written off		$8,906,170.87
Sinking Fund—		
Cash transferred to Sinking Fund to pay Water Bonds maturing in 1918		15,000.00
Floating and Nominal Assets—		
Cash in hands of City Treasurer		575,158.35
($79,374.66 of the above represents Depreciation Reserve Cash.)		
Revenue Accounts Receivable—		
Water, 1917	$317,259.28	
Miscellaneous, 1917	3,292.17	
Miscellaneous, previous to 1917	253.73	320,805.18
Materials and Supplies		86,931.04
Chargeable Work in progress		3.20
Prepaid Accounts—		
Boiler Insurance	209.58	
Interest on Bonds maturing in 1918	5,062.50	5,272.08
Total Assets		$9,909,340.72

LIABILITIES.

Capital Liabilities—		
Donded debt		$ 240,000.00
Revenues levied in advance—		
Prepaid Lock, Box, Test and Set Bills		223.21
Customers' Deposits—		
Hydrant Wrenches	$ 411.00	
Customers' Meter Deposits (Building purposes)	550.00	961.00
Sundry Accounts Payable (Unpaid Vouchers)	$22,875.07	
Accrued Accounts (Payrolls)	375.00	23,250.07
Contract Liabilities Deferred		68,121.48
Duplicate payments uncalled for		239.85
City Unreserved Proprietary Interest		$9,576,545.11
Total Liabilities		$9,909,340.72

FINANCIAL

It is very gratifying to be able to report at the close of the year 1917, that the revenues of the Water Works again show a substantial increase over the preceding year.

The revenues for water only were $1,031,931.27, being an increase of $61,155.41. It is the first time that the revenues for water exceeded the million dollar mark.

The total revenues of the department from all sources were $1,104,207.99.

The net revenues of the department over and above operation, maintenance, depreciation, and interest on bonded indebtedness, were $563,976.89, of which sum $200,000.00 was transferred to the General City Fund towards reducing the general tax, and the remainder used for new construction work and equipment.

The surplus earnings of the Water Works transferred to the General City Fund since 1892 now aggregate the sum of $2,717,-965.00, exceeding the amounts raised by tax levy in support of the Water Works before the department was self-sustaining, by $840,-426.28. No bonds were issued during the past year. All new construction work was paid out of surplus earnings and depreciation reserve cash of the Water Department, which under the public utility law may be used for new constructions, extensions or additions to property, or invested.

The book value of the Water Works less depreciation written off is $8,906,170.87, with a bonded indebtedness, less Sinking Fund on hand, of $225,000.00.

Attention was called in the 1916 report to an entry made on the books of the Water Works increasing the value of the property and plant in the sum of $309,573.52 so that the book value and the net physical valuation made by the department as of December 31, 1916, would be identical.

This entry has been reversed as the Railroad Commission desired to have the property and plant distributed over its classification of accounts based on actual cost leaving the amounts written off as a liability on the books in place of fixing a net value on the plant on December 31, 1916.

A new property record will be opened during the coming year in conformity with the desires of the Railroad Commission.

STATEMENT SHOWING ESTIMATED COST OF SUPPLYING WATER AND REVENUE RECEIVED FOR SUPPLYING WATER TO CONSUMERS DURING THE YEAR 1917.

COST.

Cost of operation	$384,497.21	
Interest on bonded debt	10,800.00	
Total ordinary expenditures		$ 395,297.21
Sinking fund for bonded indebtedness	$ 15,000.00	
Depreciation on Water Works property and equipment	109,324.74	
*Taxes on true value of Water Works property	128,845.57	
*Interest on net invested capital at 4 per cent	356,246.83	609,417.14
Total estimated cost of supplying water during 1917, which includes cost of operation, interest and sinking fund, depreciation, taxes and interest on net invested capital at 4 per cent		$ 1,004,714.35
Total pumpage during the year 1917		21,724,207,840
Cost per 1,000 gallons based on total pumpage and total ordinary expenditures		$ .01819
Cost per 1,000 gallons based on total pumpage and total ordinary expenditures, plus sinking fund charges, depreciation, taxes and 4 per cent interest on net invested capital		.04624

REVENUE.

Total revenue for water only	$ 1,031,931.27
Revenue per 1,000 gallons based on total pumpage	.04750

OPERATION AND MAINTENANCE.

The cost of operation and maintenance for the year 1917 excluding depreciation was $384,497.21, or an increase of $80,258.12 over the preceding year. The increased cost of operation is partly due to increased fuel consumption by reason of greater pumpage and inferior coal, but primarily to the inflated prices of materials and

*The items of taxes and interest are not actually charged on the books of the department. The department has used these monies for new construction work and outlays and in this manner has been able to pay for all new construction work and outlays from 1896 to 1913 without the necessity of issuing bonds. A bond issue of $300,000.00 was found necessary in 1913 for the construction of Section No. 1 of the Linnwood Avenue Intake Tunnel, the contract for which amounted to $450,000.00.

supplies entering directly into the cost of operating a water utility. The item of coal alone increased the cost of operation $50,000.00. A small increase in salaries and wages constituted another element of increased cost. The increased cost of operation, however, is offset by an increase of $61,155.41 in operating revenues.

The cost of operation based on the pumpage was $17.70 per million gallons, or an increase of $2.56 per million gallons compared with the previous year. All but 19 cents per million gallons of the increased cost of operation is due to increased cost of pumpage.

CONSTRUCTION.

The total amount expended for new construction work and equipment was $405,259.16.

WATER RATES.

Since May 1st, 1913, all services are metered, with the exception of such supplying Automatic Fire Sprinkling Systems, Fire Hydrants, Fire Cisterns, Horse Drinking Troughs and Bubblers.

The metered rate which remains unchanged is 4½ cents per 100 cubic feet or 6 cents per 1,000 gallons for water supplied within the city; and 6 cents per 100 cubic feet or 8 cents per 1,000 gallons for water supplied for consumption beyond the city limits. There is no "minimum charge," nor "service charge," the consumer paying only for actual consumption. The meter must be furnished by the consumer.

The charge for hydrant rental is $5.00 per hydrant, per year; Drinking Troughs and Bubblers, each $50.00 per year.

Water is furnished outside of the city to the Villages of East Milwaukee, West Milwaukee, North Milwaukee, Whitefish Bay, the City of West Allis, County Institutions in the Town of Wauwatosa, and to a number of individual consumers in the Towns of Lake, Milwaukee, Greenfield and Wauwatosa.

WATER SUPPLY.

The source of Milwaukee's entire water supply is Lake Michigan. The present Intake which is known as the North Point Intake is 8,146 feet in length and consists of a brick tunnel 7½ feet internal diameter and 3,146 feet in length, extending from the Shore Shaft to a Lake Shaft in a crib. From the latter two parallel lines

of 60-inch cast iron water pipe laid in a trench at the bottom of the lake extend 5,000 feet farther out into the lake into 60 feet depth of water. The upturned pipes at the outer ends are held in place by submerged cribs. From the Shore Shaft a Shore Tunnel 7½ feet in diameter extends to and in front of the pumping station with branches leading to the several pump wells.

The distance of the Intake from the mouth of the harbor is 3½ miles. The capacity of the Intake with a drop of 4 feet in the pump wells is 75,000,000 gallons in twenty-four hours, and with a drop of 8 feet in the pump wells, 95,000,000 gallons. The latter figure represents the maximum capacity of this Intake.

During the past year, Section No. 2 of the new Linnwood Avenue Intake Tunnel proper, consisting of a concrete lined tunnel 12 feet in internal diameter and 2,500 feet in length was completed by the contractors, O'Brien & Jackson Construction Co., who also placed the submerged intake crib in position immediately over the terminus of the tunnel, 6,500 feet from shore.

The sinking of the lake shaft was unfortunately interrupted on Sept. 9, 1917, when a heavy sea caused by a northeast gale wrecked the superstructure built on the submerged crib on which the steel working crib was set, causing it to tilt and moving it out of its position. Owing to the lateness of the season, no effort was made to resume work. The contractors expect to take up work again next spring or as soon as weather conditions out in the lake will permit it, and if no further mishaps occur the tunnel will be ready for service some time next summer.

The total length of the new tunnel is 6,500 feet, internal diameter 12 feet, capacity 220,000,000 gallons in 24 hours at a velocity of three feet per second; location 1½ miles north of the present North Point Intake.

The original intake consisting of a 36-inch cast iron water pipe extending only 2,100 feet out into the lake in 18 feet depth of water was permanently placed out of service at the time of the completion of the North Point Intake on September 25, 1895.

WATER PURIFICATION.

The treatment of our water supply with liquid chlorine was continuous during the year with the exception of a few days, when it was found necessary to substitute hypochlorite of lime owing to delays in shipments of liquid chlorine from Niagara Falls.

Laboratory tests made show that the average number of bacteria in 1 c.c. of untreated water developings on gelatine plates, incubated 48 hours at 20° C. was 4053, and on standard agar plates, incubated 48 hours at 37° C., 195.

The average number of bacteria in 1 c.c. of treated water developings on gelatine plates, incubated 48 hours at 20° C. was 97, and on standard agar plates, incubated 48 hours at 37° C., 22.

"Presumptive tests" indicated the presence of B. Coli in 100 per cent of all 10 c.c. samples of untreated water examined, and in 83 per cent of all the 1 c.c. samples of untreated water examined in 1917. In the treated water, B. Coli was present in 87.8 per cent of all the 10 c.c. samples and in 16.7 per cent of all 1 c.c. samples examined.

The amount of chlorine applied varied from 28 to 48 ounces per million gallons of water, or from 0.21 to 0.36 parts available chlorine per million parts of water. An average removal of 97.80 per cent of all bacteria, based on gelatine count was accomplished by this treatment.

Beginning January 17th, lactose broth was used as a culture medium in place of lactose bile in making "presumptive tests" for B. Coli, and since January 22nd, five tubes of 10 c.c. each of lactose broth are used to a test, in place of one 10 c.c. tube of lactose bile as heretofore. This was done in order to conform with the methods in use by the United States Public Health Service. As lactose broth appears to be a more favorable media for gas forming bacteria, the percentage of positive tests for B. Coli was considerably higher than in former years. On only sixty-six days did our treated water meet the standard fixed by the United States Treasury Department for common carriers in interstate commerce.

During the winter months numerous complaints were again received on account of the disagreeable taste in our water supply. With a view of securing greater efficiency from the use of liquid chlorine, and, if possible, eliminating taste and odor in our water during the winter months without impairing the efficiency of the chlorine treatment, a number of experiments were made during the month of March, covering a period of thirty days. All of these tests were planned and supervised by Mr. William R. Copeland, Chief Chemist of the Sewerage Commission, assisted by Mr. Arthur E. Kienth, Water Department Chemist, and Mr. Eugene Howard, chemist, who was temporarily engaged for the period of the experimental work.

In view of the fact that statements had been made to the effect that if liquid chlorine were applied in its gaseous condition directly to the water to be purified, in place of the present solution feed, our troubles would be obviated, this method of applying chlorine was given a thorough trial. Chlorine gas was conveyed by means of a one-inch pipe extended from a point about forty-five feet below the water surface in the shore shaft to the second floor of the laboratory building and there connected with the chlorine cylinders. At the terminus of the pipe in the shaft filtrose plates were attached to a manifold, the filtrose plates to act as diffusers. After trying this method of treatment for several hours on March 21st and 22nd, the gas odor became very strong, evidently bubbling to the surface, and it was found necessary to shut down the feed.

In removing the filtrose plates, it was found that the pipe manifold and chambers beneath the filtrose plates were filled with a yellow crystalline deposit of Chlorine Hydrate. Subsequently a third test was made using quarter inch pipe in place of one inch, in the expectation that the increased velocity of the gas through the smaller pipe would prevent the gas from crystallizing before reaching the diffusers. However, as in the previous tests, the yellow crystals of Hydrate formed in a few hours necessitating the shutting off of the feed.

From this it was quite apparent that feeding the dry gas through grids or filtrose plates is a difficult matter to control, as the crystals of hydrate formed in the winter do not dissolve in the cold lake water.

Tests were also made by adding carbonic acid gas to the raw water, on the assumption that in adding carbonic acid gas, any hypochlorous acid formed in liquid feed would be decomposed and nascent oxygen set free as a disinfecting agent. A series of tests were made, the Colon Bacillus, however, was not eliminated; practically every sample being positive.

Another test was made by discharging oxygen into the water. The data obtained, however, shows that the oxygen did not destroy the free chlorine nor eliminate the gas forming bacteria or destroy taste. A number of other tests were made all with negative results.

The conclusions reached by Mr. Copeland are that there is no simple chemical treatment applicable to the present physical conditions at the North Point Pumping Station that will cause the chlorine to destroy all gas forming bacteria and at the same time eliminate taste and odor.

The typhoid death rate per 100,000 of population for the year 1917 was 5.9, there being 26 deaths and 89 cases reported by the Health Department.

PUMPING DIVISION.

The total amount of water pumped from the lake at North Point Pumping Station during the year 1917, was 21,724,207,840 gallons, computed from the actual plunger displacement of the pumps with no allowance for slippage. This is an average daily consumption of 59,518,377 gallons, and an average daily increase of 4,633,011 gallons over the preceding year. All previous pumping records were broken on July 31st, when a pumpage of 87,664,880 gallons in twenty-four hours was recorded. The minimum pumpage in any one day was on April 29th, viz.: 40,443,240 gallons.

The average daily consumption for the past five years has been as follows:

Year	Gallons
1913	47,926,734
1914	48,509,573
1915	47,444,314
1916	54,885,366
1917	59,518,377

The amount of water repumped at the High Service Pumping Station was 1,482,555,600 gallons. In addition thereto three 12,000,000 gallon pumping engines located at North Point Pumping Station delivered 8,536,137,750 gallons direct into the high level district. The amount of water delivered in the high level district was 46.1 per cent of the total pumpage.

The total amount of water furnished to consumers outside of the city was 2,471,811,600 gallons, or 11.37 per cent of the entire pumpage.

The revenue received for water furnished outside of the city was $199,016.93 or 19.28 per cent of the total revenue received for water.

The average head pumped against in the low service was 164.6 feet, high service 277.3 feet. Average head of high and low service 208.967 feet, which is an increase of 5 feet over the preceding year. The average daily consumption per capita, which in 1916 was 118 gallons, increased to 125.3 gallons in 1917, due to the increased demands of our large industrial consumers.

Owing to the scarcity of coal, it was impossible to secure contracts on the "B. T. U." basis as has been the practice for the past ten years. The quality of the coal was by far inferior to that received in the past, which is reflected in the high percentage of ashes and clinkers and the lower station duty of the pumping engines. The percentage of ashes at North Point Station was 16.66, High Service Station, 11.25.

The average duty of all engines at North Point Station was 108,432,773 foot pounds per 100 pounds of coal, and for the High Service Pumping Station, 81,815,151 foot pounds, being a decrease of 3,330,316 and 3,363,169 foot pounds, respectively, compared with the year 1916.

The High Service Pumping Station is not operated at night, which accounts for the lower station duty.

The total amount of coal consumed at the North Point Pumping Station was 17,789 tons and at the High Service Pumping Station 1,028 tons.

At the North Point Pumping Station the 10-ton wagon scale was replaced by a 20-ton Auto Truck Scale with type registering beam as all coal is now delivered by large auto trucks.

On May 2nd, proposals were received by the Commissioner of Public Works for one 12,000,000 gallon Triple Expansion Pumping Engine for the North Point Pumping Station. Two proposals were received, one from the Worthington Pump & Machinery Corporation, of New York, in the sum of $191,050.00, and the other from the Allis-Chalmers Mfg. Co., of Milwaukee, Wis., in the sum of $175,000.00. As only $90,000.00 was set up in the 1917 budget for the purchase of this pump, an additional appropriation in the sum of $85,000.00 had to be made by the Common Council before the contract could be awarded. This was done and on June 11th, the Commissioner of Public Works awarded the contract to the Allis-Chalmers Mfg. Co. at their proposal price.

A similar pumping engine in every respect was purchased less than five years ago at a cost of $74,200.00. As this pump was an absolute necessity, the purchase of same could not be deferred on account of high cost.

On April 4th, a contract was awarded to the Downey Heating and Supply Co., of Milwaukee, Wis., for furnishing and installing at the North Point Pumping Station two 300 H. P. Water Tube Boilers with Jones Underfeed Stokers and Dravo Superheaters at the contract price of $23,677.00; these boilers to be installed in the

South Boiler House and to replace the present two Horizontal Tubular Boilers.

On June 23rd, during a severe thunderstorm, the chimney at the High Service Pumping Station was struck by lightning, tearing out large sections of the outer course of brick; the falling brick doing considerable damage to the roof of the boiler room and coal house. The damage done was immediately repaired and there was no interruption in the operation of the station.

The work of extending the water tower 23 feet so as to enclose entirely the stand pipe at the High Service Pumping Station as recommended in last year's report was completed during the month of November.

Only ordinary repairs to boilers and engines were found necessary to keep the equipment of both stations up to their usual first-class condition.

DISTRIBUTION DIVISION.

During the past year, the pipe distribution system was increased by the laying of an additional 24,977 lineal feet or 4.730 miles of water pipe, giving us a total of 540.762 miles at the close of the year.

All new mains are laid under contract, the department furnishing pipe, specials, gates and hydrants. Plans for the laying of the water pipe are prepared by the City Engineer who also gives the necessary lines and grades.

A total of 1897 tap and branch connections were made to our system during the past year, of which number, 1394 were improvement taps and extended to curb only. This gives a total of 85,305 taps and branches to date. Of this number 64,968 are active taps and 20,337 extended to curb only or turned off at either curb or at the main and not in use.

The widening of the Menomonee River west of Reed St., on which work was begun in 1916, made it necessary to contract for the extension of the 24-inch cast iron water pipe river crossing which crosses the Menomonee River at the foot of Third St. extended. The Edward E. Gillen Co., to whom a contract was awarded to build the new dock and extend the additional river crossing, cut the pipe in the bed of the river and plugged the same temperorily until the United States Government could do the necessary dredging for the widening of the river.

Upon the completion of the widening of the river sometime in June, 1917, the Edward E. Gillen Co. attempted to carry out its contract of extending the pipe in the bed of the river when it was discovered that the river crossing had been damaged by either a boat or dredge passing up the river. In order to find out to what extent the crossing had been damaged, authority was secured from the Common Council for an inspection and test of the crossing. An inspection was made which disclosed the fact that the crossing had been damaged to such an extent as to make it absolutely useless for further service.

This being the case, it was decided to abandon the river crossing at Third Street, and to construct a water pipe tunnel at West Water Street, this being a safer and better method of carrying feeder mains across navigable streams. West Water Street was selected for the reason that the river is narrower at this point than at Third Street, and for the further reason that the shafts of the tunnel if located on Third Street would be on private railroad property which would be very undesirable. It is planned to do this during the coming year.

On October 4th a serious break occurred in the 16-inch main in Muskego Avenue at the intersection of South Canal Street, when a steel sheeting was driven through the water pipe by the sewer contractor working at this point. This break placed 27 fire hydrants and 8 fire cisterns out of service, also deprived a number of large packing houses and other manufacturing establishments from the use of city water for a period of 24 hours which it required to repair the break. The Fire Department transferred one of the fire boats temporarily to this location in order to afford fire protection to this hazardous locality.

A total of 21 breaks in water mains occurred during the past year of which number 7 were due to electrolysis.

An electrolysis survey made during the year of the distribution mains of the Water Works by Mr. E. E. Brownell, Consulting Electrical Engineer of Philadelphia, Pa., confirms the reports of previously made surveys by Mr. Ray Palmer in 1911 and Frank K. Brainard in 1915, viz.: that the distribution mains and services of the Water Works have suffered from electrolysis due to stray electric street railway currents, not only in the past, but are still being damaged in certain localities. The City Attorney has taken up the matter with the three street railway companies operating in this city with a view of compelling them to install a system of

electrolytic mitigation which will remedy or bring to a minimum the dangerous conditions existing at present.

KILBOURN PARK RESERVOIR.

The reservoir which is located in Kilbourn Park no longer serves as a storage reservoir as it did in the early years after its construction. The purpose it now serves is to equalize the pressure in the low service district and as the source of supply for the High Service Pumping Station on North Avenue between 10th and 11th Streets.

The reservoir is of irregular shape and was built to conform to the grounds on which it is located. Its average length is 515 feet, average width 310 feet. When the depth of water in the reservoir is 21.5 feet the elevation of water above datum is 150 feet. At this level the capacity of the reservoir is 21,000,000 gallons or about one-third of a day's supply.

The park connected with the reservoir was kept in the usual attractive condition.

A very heavy rainstorm on June 23, 1917, caused considerable sliding of the embankments on the east and west sides of the reservoir. Fortunately no serious damage resulted from same. The earth washed away was filled in with clay and the surface again sodded. Several lines of iron pipe were laid down the embankments, at a depth of about one foot to carry off the water from the walk around the top of the reservoir.

As in previous years band concerts were given during the months of July and August at an expense of $494.00 which was paid out of the Water Fund.

The following table indicates the depth of water maintained in the reservoir each month of the past year:

Month	Highest	Lowest	Mean
January	21.90	16.70	20.01
February	21.90	16.00	19.19
March	21.60	16.50	20.46
April	21.60	16.80	20.03
May	21.60	16.60	19.88
June	21.50	15.40	19.94
July	21.80	13.50	19.75
August	21.90	18.00	20.47
September	21.80	16.20	20.14
October	21.80	17.10	20.26
November	21.80	17.90	20.24
December	21.90	17.90	20.35

Highest during year, 21.90 feet.
Lowest during year, 13.50 feet.
Average mean, 20.06 feet.

METER DIVISION.

During the past year, 1,544 new meters were installed which is somewhat below the average yearly installations, and 496 placed "Out of Service" on account of replacements with new meters or taken off on account of removal of buildings, etc., which leaves 64,325 meters in actual service on Dec. 31, 1917.

A total of 14,945 meters or 23.2 per cent were repaired during the year, 11,154 or 74-2/3 per cent requiring only adjustment and cleaning due mostly to sand troubles, for which no charge was made, while 3,791 or 25-1/3 per cent needed new parts, the cost of which amounting to $14,499.03 was charged to the consumer.

This division also has charge of the sealing and inspection of all automatic sprinkler installations which in the absence of meters are controlled in this manner. There were 205 premises so equipped on Dec. 31, 1917, of which 433 inspections were made during the past year. In addition thereto, 3,055 inspections were made of hydraulic elevators equipped with indicators, private fire hydrants, public improvement services, and other miscellaneous services, all with a view of eliminating unnecessary waste of water.

COLLECTION DIVISION.

The number of bills issued each year by the Collection Division is approximately 250,000. In order to handle this large volume of work expeditiously, it is imperative that all duplication or unnecessary work be eliminated.

The present method of handling customers' accounts by tap numbers kept in numerical order in sections of 10,000 taps assigned to each bookkeeper or section clerk, has been found too cumbersome, as it necessitates the transcribing of all meter readings to individual reading slips and assorting same for each section clerk preparatory to posting on ledger cards. It also requires that all readings be in before any billing can be done. After bills are made out they must be assorted, first, into routes, and then each route into street and house number rotation, causing a great deal of unnecessary work.

The Department has perfected a new plan of handling the accounts on what is known as the "block system," which it expects to put in effect July 1, 1918. The city will be divided into units

of blocks of one or more squares containing approximately 100 consumers and given a permanent block number. The accounts in each block will be arranged in numerical order from one up. As the consumers' cards in the office will be set up in precisely the same order in which the meters will be read, billing can be done directly from the meter reader's route book as soon as the first block is read, leaving the bills in proper order for delivery by the meter reader without any assorting. It will also permit all billing to be done by machine, producing a neater bill, and as the machine adds the amount while printing, will save a great amount of labor now spent in checking bills with the assessment roll.

The introduction of the new system will be the means of saving time, printed matter, give better service, and eliminates all unnecessary work in connection with billing and collecting.

CONCLUSION.

In closing my report, I desire to express my appreciation, to all my assistants for their promptness and efficiency and for the uniform courtesy received at your hands.

The usual statistical matter relating to the Water Works is presented in the following pages.

Yours truly,

H. P. BOHMANN,

Supt. of Water Works.

SUMMARY OF STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1917.

In form recommended by the New England Water Works Association.

MILWAUKEE WATER WORKS.

Milwaukee, Milwaukee County, Wisconsin.

GENERAL STATISTICS.

Population by census of 1910, 373,857. Present population estimated at 450,000.

Date of original construction, 1872-1874.

By whom owned, City of Milwaukee.

Mode of supply (whether gravity or pumping), pumping.

PUMPING STATISTICS.

1. Builders of pumping machinery, Edward P. Allis Co., Allis-Chalmers Co., Wisconsin Engine Co.
2. Description of fuel used:
   - A. Kind, bituminous.
   - B. Brand of coal, Pocahontas screenings and Youghiogheny screenings.
   - C. Price of coal per ton of 2,000 lbs., delivered by team to Pumping Station:
     Pocahontas screenings, $3.35 to $7.60. Youghiogheny screenings, $3.10 to $7.25.
   - D. Percentage of ash of coal consumed at North Point Pumping Station, 16.66.
   - E. Percentage of ash of coal consumed at High Service Pumping Station, 11.25.
   - F. Wood, price per cord, none used.
3. Coal Consumed:
   - A. North Point Pmping Station (for all purposes).....35,578,850 lbs.
   - B. North Point Pumping Station (while pumping).....35,515,250 lbs.
   - C. High Service Pumping Station (for all purposes)..... 2,055,800 lbs.
   - D. High Service Pumping Station (while pumping)..... 1,704,200 lbs.
4. Pounds of wood consumed ÷ 3 = equivalent amount of coal, none.
   - A. Amount of other fuel used, none.
5. Total equivalent coal consumed for the year (4) lbs., none.
6. A. Total pumpage for the year at North Point Pumping Station where all direct pumpage from the lake is done, 21,724,207,840 gallons.

B. Total pumpage for the year at High Service Pumping Station where the water is repumped from the reservoir into the High Service district, 1,482,555,600 gallons.

7. Average static head against which pumps work (North Point Pumping Station low service), 150 feet.

8. A. Average dynamic head against which pumps work (North Point Pumping Station), low service 164.689, high service 277.376. Average of high and low service 208.967 feet.

B. Average dynamic head against which pumps work (High Service Pumping Station), 112.806 feet + suction head 10.143 feet + 128.30 feet elevation of gauge = 251.249 feet above datum.

9. A. Number of gallons pumped per pound of equivalent coal (5), none.

10. Duty $= \frac{\text{Gals. pumped (6. A) X 8.34 (lbs.) X 100 X dynamic head (8. A).}}{\text{Total fuel consumed while pumping at North Point Pumping Station (3 B).}} = 108{,}432{,}773$ lbs.

11. Cost of pumping figured on pumping station expenses, viz., North Point Pumping Station, $170,039.92; High Service Pumping Station, $20,760.39.

(a) Per million gallons pumped at North Point Pumping Station, $7.83.

(b) Per million gallons repumped at High Service Pumping Station, $14.00 + $7.83 = $21.83.

12. A. Per million gallons raised one foot (dynamic) at North Point Pumping Station, $0.0374.

B. Per million gallons raised one foot (dynamic) at High Service Pumping Station, $0.1138.

STATISTICS OF CONSUMPTION OF WATER.

1.	Estimated total population at date (city only)	450,000
2.	Estimated population on lines of pipe (city only)	450,000
3.	Estimated population supplied (includes suburbs)	475,000
*4.	Total consumption for the year	21,724,207,840 gallons
5.	Passed through meters	15,375,711,100 gallons
6.	Percentage of consumption metered	70.77
7.	Average daily consumption	59,518,377 gallons
8.	Gallons per day to each inhabitant (1), after deducting water furnished outside of city	117.2 gallons
9.	Gallons per day to each inhabitant, including population supplied outside of city (3)	125.3 gallons

*No deduction for slippage, estimated at 5%.

10. Gallons per day to each tap..... 917 gallons
(This is figured on taps in actual use, of which number 64.325 are metered, 198 elevator indicators and 445 unmetered.)
(The latter consists of 205 Automatic Fire Sprinkler Systems, and Public Drinking Troughs, Bubblers, etc.)

11. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation ($493,-821.95), $22.73.

12. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation, plus interest on bonds, $23.23.

STATISTICS RELATING TO DISTRIBUTION SYSTEM MAINS.

1. Kind of pipe, cast iron.
2. Sizes from 4 to 42 inch.
3. Extended 24,977 lineal feet, 4.730 miles.
4. Discontinued, lineal feet, none.
5. Total now in use, 540.762 miles.
6. Cost of repairs per mile, including valves and boxes, $7.95.
7. Number of leaks per mile, .123.
8. Length of pipe less than 4 inches in diameter, none.
9. Number of hydrants added during the year, 52—2 cut out.
10. Number of hydrants now in use, 3731.
11. Number of stop gates added during the year, 73.
12. Number of stop gates now in use, 4,359.
13. Number of stop gates smaller than 4 inch, 1.
(In addition to the above gates there are 2,178 gates from 2 inches to 8 inches controlling branch connections.)
14. Number of blow-offs, 64.
15. Range of pressure on mains, 20 to 90 pounds.

SERVICES.

16, 17, 18, 19, 20, 23, 24. All services put in by consumer.

21. Number of services (taps and branches) added during the year, 1,897.

22. Number of services connected to mains, 83,127 taps and 2,178 branches, a total of 85,305.

25. Number of new meters added during the year, 1,628.

26. Number of meters now in use, 64,325, after deducting meters permanently off.

27. *Percentage of services metered, 99.

28. Percentage of receipts from metered water, 94.43.

29. Number of motors and elevators added, none; 3 taken out.

30. Number now in use, 198.

---

*Figured on services in actual use, of which 64,325 are metered, 19 elevator indicators and 445 unmetered. The latter consists of 205 Auto matic Fire Sprinkler Systems, and Public Drinking Troughs, Bubblers, etc

NOTE—A more complete report of the Water Works is published unde separate cover giving the detailed activities of each division of the Wate Works, which report may be had on request.

Mun. Ref.

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN EIGHTEEN

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN

COMPLIMENTS OF
PERCY BRAMAN
DEPUTY COMMISSIONER OF PUBLIC WORKS
MILWAUKEE, WIS.
1918 REPORT

PLEASE EXCHANGE

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN EIGHTEEN

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN EIGHTEEN

352.5
M64
1918
Mun. Ref.

Department of Public Works

PERCY BRAMAN

Deputy Commissioner of Public Works

CHARLES J. VAN ETTA.... *Supt. Bureau Street Construction and Repairs.*
CHARLES O. DAVIS..... *Supt. Bureau of Street Sanitation.*
DAVID McKEITH..... *Supt. Bureau of Bridges and Public Buildings.*
GEORGE F. STAAL..... *City Engineer, Bureau of Engineering.*
HENRY P. BOHMANN..... *Superintendent Water Works.*
FRANK H. MAYHEW..... *Head Clerk.*

Office of

THE DEPARTMENT OF PUBLIC WORKS.

Milwaukee, January 24, 1919.

To the Honorable Mayor and Common Council of the City of Milwaukee:

Gentlemen:

Submit herewith the report of this department for the year 1918 under captions embracing the various bureaus of the department, these reports being over the signature of the bureau heads.

Courteously yours,

PERCY BRAMAN,
Deputy Commissioner of Public Works.

Milwaukee, Wis., January 14 1919.

Mr. Percy Braman,

Deputy Commissioner of Public Works.

Dear Sir:

I herewith submit the annual report of the Department of Public Works for the year ending December 31st, 1918.

The report embraces the work of the Audit and Account and the Assessment Division, also giving in detail the following information:

Statement of net expenditures of the department and its various bureaus.

List of contracts awarded.

Number of permits issued, and revenue received.

List of streets placed under guarantee during 1918.

List of streets improved, with yardage and cost of each.

Inventory of the department by Bureaus.

Statement of all special assessments.

The report of 1918 is compiled on the basis of the report of the preeeding year with little or no material change.

Respectfully submitted,

FRANK H. MAYHEW,
Head Clerk.

Accounting Division

Statement of Net Expenditures for the Year Ending

December 31, 1918, of the

DEPARTMENT OF PUBLIC WORKS,

Divided According to its Bureaus.

1918.

GENERAL ADMINISTRATION.

dministration—		
Salaries—Commissioner, etc.	$ 9,985.47	$ 1,879.92
Supplies—Office	39.85	
Contract or Open Order Service—Repairs, etc.	31.00	
Fixed Charges—Advertising, etc.	2,114.86	
	$12,171.18	$ 1,879.92
udit and Accounts—		
Salaries—Chief Clerk, etc.	$ 6,325.02	
Supplies—Office	656.97	
Contract or Open Order Service—Repairs, etc.	38.00	
Equipment—Office	79.50	$ 75.00
	$ 7,099.49	$ 75.00
pecial Assessments—		
Salaries—Chief Assessment Clerk, etc.	$ 5,380.00	
Supplies—Office	123.08	
Contract or Open Order Service—Repairs	43.65	
Advertising and Appraisals	990.70	$ 9,060.00
	$ 6,537.43	$ 9,060.000

BUREAU OF BRIDGES AND PUBLIC BUILDINGS.

dministration—		
Salaries—Superintendent, etc.	$15,692.80	
Supplies—Office, etc.	257.41	
Minor Instruments—Drawings, etc.	6.88	
Contract or Open Order Service—Repairs, etc.	862.50	
Equipment—Office, etc.	49.40	
Miscellaneous Accounts Receivable		$ 10.00
	$16,868.99	$ 10.00
onstruction—		
Salaries—Inspection	$ 265.00	
North Avenue Viaduct	600.00	
35th Street Stairway	382.00	
La Fayette Railing	287.25	
Bridge Yard	4,041.75	
Blue Mound Sanitarium Dining Hall	21,983.34	
Jackson Street Natatorium	9.71	
Fifth Ave. Natatorium	40,358.73	
Police Station	29,214.20	

Common Council Contingent Fund	17,685.85	
Muskego Ave. Retaining Wall	16,251.03	
Reservoir Ave. Fence	4,504.72	
Isolation Hospital	33,514.90	
U. S. Government Breakwater	3,754.32	
Central Market Scale House	33.72	
Cleveland Ave. Bridge	4,271.97	
Miscellaneous Accounts Receivable		$ 75.0
	$177,158.49	$ 75.0

Bridges and Viaducts

Superintendence—

Salary—Superintendence	$ 257.00	
Supplies—Fuel, etc.	2.00	
Contract or Open Order Service	133.26	
	$ 392.26	

Maintenance—

Salaries—Iron Workers, etc	$11,898.02	
Supplies—Fuel, etc.	527.63	
Minor Instruments—Tools, etc	474.08	
Material—General	5,478.83	
Contract or Open Order Service—Repairs, etc	2,195.08	
Special Fund—Bridge Repairs	43,066.87	
Miscellaneous Accounts Receivable		$ 6,863.
	$63,640.51	$ 6,863.

Operation—

Salaries—Bridge Tenders, etc	$93,792.34	
Supplies—Fuel, etc.	2,234.31	
Minor Instruments—Tools, etc	15.25	
Contract or Open Order Service—Light, Power	662.37	
Equipment	47.00	
	$96,751.27	
Special Work—Rotary Fund	3,478.44	
	$ 3,478.44	

City Hall—

Heat and Power—

Salaries—Engineer, etc.	$14,366.48	
Supplies—Fuel, etc.	$28,039.23	
Minor Instruments—Tools, etc	27.73	
Material—General	775.78	
Contract or Open Order Service—Repairs, etc	2,550.16	
Miscellaneous Accounts Receivable		$ 24
	$45,759.38	$ 24

Electrical Service—

Salaries—Electrician, etc.	$ 4,680.00	
Supplies—General, etc.	201.73	
Minor Instruments—Tools, etc.	6.52	
Contract or Open Order Service	79.19	
Material—General	484.63	
Miscellaneous Accounts Receivable		$ 205.91
	$ 5,452.07	$ 205.91

Janitorial Service—

Salaries—Custodian, etc.	$18,125.61	
Supplies—Cleaning and Disinfecting	345.31	
Minor Instruments—Tools, etc.	.19	
Contract or Open Order Service—Repairs	70.69	
	$18,541.80	

Elevator Service—

Salaries—Elevator Operators, etc.	$ 5,413.22	
Material—General	120.31	
Contract or Open Order Service—Repairs, etc.	2,963.91	
	$ 8,497.44	

Telephone Service—

Contract or Open Order Service—Telephone Service	$ 4,536.15	
Miscellaneous Accounts Receivable		$ 332.33
	$ 4,536.15	$ 332.33

General Service—

Salaries—Watchman, etc.	$12,427.48	
Supplies—General	310.17	
Minor Instruments—Tools, etc.	233.31	
Material—General	213.66	
Contract or Open Order Service—Repairs, etc.	3,520.00	
Special Fund	115.27	
Miscellaneous Accounts Receivable		$ 14.90
	$16,819.89	$ 14.90

Markets—

Central Markets—

Salaries—Market Master	$ 1,140.00
Supplies—Fuel, etc.	41.16
Contract or Open Order Service—Repairs, etc.	289.27
Special Fund	1,365.00
	$ 2,835.43

Natatoria—

Salaries—Superintendent, etc.	$28,183.29	
Supplies—Fuel, etc.	16,626.19	
Minor Instruments—Tools, etc.	445.74	
Material—General	638.13	
Contract or Open Order Service—Repairs, etc.	6,882.96	
Fixed Charges—Insurance, etc.	25.00	
Miscellaneous Accounts Receivable		$ 624.
	$52,801.31	$ 624.

Bathing Beaches—

Salaries—Superintendent, etc.	$10,083.80	
Supplies—Fuel, etc.	661.81	
Minor Instruments—Tools, etc.	6.89	
Material—General	80.40	
Contract or Open Order Service—Repairs, etc.	1,581.10	
Fixed Charges—Bond, etc.	10.00	
Special Fund	2,011.50	
	$14,435.50	

Comfort Stations—
First Avenue Viaduct—

Supplies—Fuel, etc.	$ 95.72	
Material—General	2.17	
Contract or Open Order Service—General Service	395.24	
	$ 493.13	

Municipal Garage—

Salaries—Superintendent	$ 9,647.02	
Supplies—General, etc.	9,653.48	
Equipment—General, etc.	96.49	
Material—General	3,064.41	
Contract or Open Order Service—Repairs, etc.	2,023.29	
Fixed Charges—Insurance, etc.	1,389.30	
Equipment—Motor Vehicle, etc.	13,054.98	
Special Fund—Garage Equipment	694.21	
Miscellaneous Accounts Receivable		$17,620
	$39,623.18	$17,620

BUREAU OF ILLUMINATION.

General Office—

Salaries—Engineer, etc.	$ 8,470.00	
Supplies—General	48.05	
Contract or Open Order Service—General	20.50	
	$ 8,538.55	

boratory—

Salaries	$ 1,800.00	
Supplies—General	8.68	
Contract or Open Order Service—General	8.50	
Equipment—General	404.18	
	$ 2,221.36	

orehouse—

Salaries	$ 336.29	
Supplies—General	11.88	
Contract or Open Order Service—General	154.99	
Fixed Charges—Rent, etc	1,842.84	
	$ 2,346.00	

reet Lighting Operation—

Contract or Open Order Service—Operation	$251,883.30	
Miscellaneous Accounts Receivable		$ 55.02
	$251,883.30	$ 55.02

reet Lighting Maintenance—

Salaries	$ 14,924.81	
Supplies—General	10,382.44	
Minor Equipment—Tools, etc	262.82	
Contract or Open Order Service—Repairs, etc	1,703.28	
Miscellaneous Accounts Receivable		$ 313.74
	$ 27,273.35	$ 313.74

nstruction—

Special Funds	$ 4,503.54	
	$ 4,503.54	

scellaneous—

Special Funds	$ 5,810.59	
Miscellaneous Accounts Receivable		$ 500.89
	$ 5,810.59	$ 500.89

ctric Light Plant—

Gas Unit Construction Fund	$303,205.15	
Miscellaneous Accounts Receivable		$ 1,117.55
	$303,205.15	$ 1,117.55

BUREAU OF SEWERS.

Administration—			
Salaries—Superintendent, etc.	$ 6,925.78		
Supplies—Office, etc.	80.14		
Contract or Open Order Service—Repairs, etc.	99.52		
Equipment—Office, etc.	40.00		
	$ 7,145.44		
Store Yards—			
Salaries—Labor, etc.	$ 5,533.83		
Supplies—Forage and Veterinary, etc.	2,438.51		
Contract of Open Order Service—Repairs, etc.	1,059.21		
Miscellaneous Accounts Receivable		$	511
	$ 9,031.55	$	511
Cleaning and Flushing—			
Salaries—Labor, etc.	$ 25,716.65		
Supplies—General, etc.	178.97		
Material—General	12.43		
Contract or Open Order Service—Team Hire, etc.	9,608.75		
Fixed Charges—Rent	3,755.00		
Equipment—General	868.80		
Miscellaneous Accounts Receivable		$	455
	$ 40,140.60	$	455
Repairs—			
Salaries—Labor, etc.	$ 12,311.08		
Material—Sewer	2,248.40		
Contract or Open Order Service—General Service	92.91		
Miscellaneous Accounts Receivable		$	33
	$ 14,652.39	$	33
Construction—City—			
Materials	$112,538.15		
	$112,538.15		
Construction—Contract—			
Concrete Sewer	$175,912.92		
Pipe Sewer	33,754.50		
Miscellaneous Accounts Receivable		$	2,87
	$209,667.42	$	2,87

BUREAU OF STREET CONSTRUCTION AND REPAIRS.

uperintendence—

Salaries—Superintendent, etc.	$ 8,309.42	
Supplies—Office, etc.	244.15	
Contract or Open Order Service—Repairs, etc.	1,640.96	
Equipment—Office	317.10	
	$ 10,511.63	

:sting Laboratory—

Salaries—Chemists, etc.	$ 3,240.00	
Supplies—Laboratory, etc.	83.64	
Minor Instruments—Apparatus, etc.	83.75	
Contract or Open Order Service—Repairs, etc.	10.00	
Equipment—Laboratory	274.56	
	$ 3,691.95	

nstruction—

Special Funds	$ 20,755.94	
Creosoted Block Paving	40,086.57	
Asphalt Paving	716,875.63	
Brick paving	5,409.83	
Stone block paving	118,875.75	
Bituminous concrete paving	153,395.20	
Concrete paving	102,914.91	
Sidewalks, grading, etc.	21,343.81	
Miscellaneous accounts receivable		21,212.62
	$1,179,657.64	$21,212.62

ntract Retainer—

Retainer paid	$ 24,384.58	
Interest paid	3,311.81	
Miscellaneous Accounts Receivable		$ 19.00
	$ 27,696.39	$ 19.00

vement Repairs—

Salaries—Foremen, etc.	$ 12,397.43	
Supplies—General	2,028.51	
Minor Instruments—Tools, etc.	220.27	
Contract or Open Order Service	11,283.67	
Equipment—Self Propelled Apparatus	6,805.05	
Special Fund	190,982.75	
Miscellaneous Accounts Receivable		$ 9,544.56
	$ 223,717.68	$ 9,544.56

Repair Shop—

Salaries—Foremen, etc.	$ 2,637.25	
Supplies—Fuel, etc.	42.47	
Minor Instruments—Tools, etc.	57.65	
Contract or Open Order Service—Livery Hire, etc.	151.37	
Equipment—General	347.14	
	$ 3,235.88	

Sidewalk Repairs and Replacements—

Salaries—Labor, etc.	$ 4,322.95	
Supplies—General, etc.	57.54	
Material—Highway	3,397.84	
Contract or Open Order Service—Team Hire, etc.	1,742.85	
	$ 9,521.19	

Rotary Fund—

Salaries—Labor	$ 18,264.90	
Miscellaneous Accounts Receivable		$11,634
	$ 18,264.90	$11,634

Track Elevation and Depression—

Special Fund	$ 172.17	
	$ 172.17	

BUREAU OF STREET SANITATION.

Superintendence—

Salaries—Superintendent, etc.	$ 10,470.00	
Supplies—Office, etc.	405.33	
Contract or Open Order Service—Motor Vehicle Repairs, etc.	372.28	
Equipment—Office, etc.	359.73	
Special Fund—Complaint Notices	98.00	
	$ 11,705.34	

Field—

Salaries—Supervisors, etc.	$ 39,978.89	
Contract or Open Order Service—Auto, etc.	1,598.50	
	$ 41,577.39	

treet Cleaning—

Salaries—Labor, etc.	$ 241,495.17	
Supplies—General	3,376.83	
Minor Instruments—Tools, etc.	3,504.43	
Contract or Open Order Service—Team Hire, etc.	97,811.17	
Equipment—Self propelled Apparatus	6,918.78	
	$ 353,106.38	

ollection of Ashes and Rubbish—

Salaries—Labor, etc.	$ 137,758.11	
Supplies—O..ce, etc.	2,847.70	
Minor Instruments—Tools, etc.	1,247.46	
Contract or Open Order Service—Team Hire, etc.	145,394.81	
Special Fund—Labor, etc.	10,886.34	
Equipment	999.00	
Miscellaneous Accounts Receivable		$ 66.40
	$ 299,133.42	$ 66.40

arbage Collection—

Salaries—Superintendent, etc.	$ 2,400.00	
Supplies—Motor Vehicles, etc.	674.41	
Material—General	6.00	
Contract or Open Order Service—Team Hire	151,612.48	
Equipment	12.00	
Miscellaneous Accounts Receivable		$ 215.00
	$ 154,704.89	$ 215.00

emoval of Dead Animals—

Contract or Open Order Service—Team Hire, etc.	$ 1,818.00	
Miscellaneous Accounts Receivable		$ 60.00
	$ 1 818.00	$ 60.00

leaning Catch Basins—

Salaries—Labor, etc.	$ 12.166.98	
Supplies—General	1,909.61	
Minor Instruments—Tools, etc.	21.22	
Contract or Open Order Service,—Team Hire, etc.	6,587.86	
Equipment	15,051.87	
	$ 35,737.54	

inor Street Repairs—

Salaries—Labor, etc.	$ 21,304.31	
Material—General	13.355.60	
Contract or Open Order Service—Team Hire, etc.	9,541.49	
Miscellaneous Accounts Receivable		$ 10.10
	$ 44.201.40	$ 10.10

Ward Yards—			
Salaries—Superintendent, etc.	$	6,070.35	
Supplies—Horse drawn apparatus, etc.		1,176.46	
Minor Instruments—Tools, etc.		162.78	
Material—General		407.02	
Contract or Open Order Service—Team hire, etc.		2,167.51	
Fixed Charges—Rent, etc.		680.00	
Equipment		221.00	
Special Fund		1,615.44	
Miscellaneous Accounts Receivable			$ 471
	$	12,500.56	$ 471
Rotary Fund—			
Special Work—Labor, etc.	$	17,822.64	
Special Work—Team, etc.		39,533.72	
Miscellaneous Accounts Receivable			$20,102
	$	57,356.36	$20,102
Public Drinking Fountains—			
Salaries—Labor, etc.	$	448.50	
Minor Instruments—Tools, etc.		2.59	
Cntract or Open Order Service—Repairs, etc.		9,008.82	
	$	9,459.91	
Skating Rinks—			
Salaries—Labor, etc.	$	293.58	
Supplies—General		14.25	
Contract or Open Order Service—Team Hire, etc.		93.45	
	$	401.28	
Street Signs—			
Salaries—Labor, etc.	$	326.80	
Supplies—General		3.06	
Material—General		25.33	
Special Fund—New Signs		312.25	
	$	667.44	
Sprinkling, Flushing and Oiling—			
Salaries—Superintendent, etc.	$	19,046.26	
Supplies—Horse Drawn Apparatus, etc.		7,236.36	
Minor Instruments—Tools, etc.		127.35	
Material—Highway		151,052.51	
Material—General		38.54	
Contract or Open Order Service—Team Hire, etc.		104,778.70	
Fixed Charges—Rent, etc.		10,336.25	
Equipment—Self Propelled		9,180.64	
Miscellaneous Accounts Receivable			$ 73
	$	301,796.61	$ 73

ssessable Service—			
Salaries—Labor, etc.	$ 28,447.75		
Salaries—Team Hire, etc.	3,018.23		
	$ 31,465.98		
iscellaneous—			
Special Funds—			
Street End Barricade	$ 665.01		
Cinder	3,145.42		
Bay View Artesian Well	3,267.45		
Kinnickinnic River	1,262.74		
Traffic Lines	87.50		
Miscellaneous Accounts Receivable		$	4.00
	$ 8,428.12	$	4.00

BUREAU OF RIVERS AND HARBOR.

rbor Commission—			
Salaries—Secretary	$ 2,160.00		
Supplies—Office	13.65		
Contract or Open Order Service—Postage, etc.	32.50		
Fixed Charges—Publications	85.61		
Equipment—Office	65.05		
	$ 2,356.81		
rbor Master—			
Salaries—Harbor Master	$ 1,320.00		
Supplies—Motor Vehicle	27.00		
Contract or Open Order Service—Repairs, etc.	71.80		
	$ 1,418.80		
cking and Dredging—			
Salary—Inspection	$ 1,110.00		
Dredging	23,650.46		
Harbor Improvements	2,456.00		
Miscellaneous Accounts Receivable		$	308.00
	$ 27,216.46	$	308.00

MISCELLANEOUS.

use Drains and Water Connections—			
Connections	$ 43,540.92		
	$ 43,540.92		
y Property—			
Rents Received			$15,944.23
Sale of Old Equipment			617.86
			$16,562.09

List of Contracts

Awarded by

the

Department of Public Works

During the Year 1918

LIST OF CONTRACTS AWARDED BY THE DEPARTMENT OF PUBLIC WORKS DURING 1918.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
3	Feb. 6, 1918.....	Dean Construction Co.....	Cutg., filg., bit. conc., curb and gut. on 26th Ave., from Hayes to Forest Home Ave.....	$ 5,544.52
4	Feb. 6, 1918.....	Milwaukee Gen'l. Const. Co.....	Cutg., filg., old pavemt. rem., bit., conc., brick gutter, alley bet. Grove, Greenbush, Mitchell and Lapham.....	3,754.02
5	Feb. 6, 1918.....	Frank Schoman.....	Ctg., filg., sidewalks, 21st St., fr. N. L. of Pease to S. L. of Melvina St.....	2,336.78
6	Feb. 6, 1918.....	R. H. Gumz.....	Cutting and filling, American Ave., from Cleveland Ave. to Kinnickinnic River.....	1,367.10
7	Feb. 6, 1918.....	John S. O'Neill.....	Ctg., filg., sidewalks, Franklin St., from 20th to 22nd St.....	1,434.65
8	Feb. 6, 1918.....	Retzlaff & Froemming.....	Ctg., bit. conc., br. gut., alley, bet. Linwood, Kenwood, Cramer and Oakland Ave.....	2,480.59
9	Feb. 6, 1918.....	Wisconsin Const. Co.....	Ctg., filg., bit. conc., br. gutter, alley, bet. 22nd, 23rd, Locust and Chambers Sts.....	2,455.68
10	Feb. 6, 1918.....	Dean Construction Co.....	Ctg., filg., bit. conc., br. gut., alley, bet. 23rd and 24th Aves., Greenfield and Scott.....	3,334.80
11	Feb. 14, 1918.....	Badger Construction Co.....	Pavemt. rem., standard asphalt pavemt., Lisbon Ave., from 31st St. to Sherman Blvd., and Pabst Ave., from Lot 8, Blk. 4, Grand Park, to Lisbon Ave.....	28,313.19
12	Feb. 14, 1918.....	F P. Caughlin Co.....	Ctg., cedar blk. pavemt. rem., asphalt pavemt., br. gutter, Fond du Lac Ave., from North Ave. to Wright St., 7th and 22nd Wds...	16,108.75
13	Feb. 14, 1918.....	Badger Construction Co.....	Ctg., filg., old pavemt. rem. st. sheet asphalt pavemt., c. curb and gut., c. sidewalks, Hadley St., from 35th to 36th Sts.....	3,215.26
14	Feb. 14, 1918.....	F. P. Caughlin Co.....	Pavemt. rem., st. sheet asphalt pavemt., cem. gut., Wisconsin St., from East Water to Broadway.....	2,409.91

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
15	Feb. 14, 1918.....	F. P. Caughlin Co.....	Ctg., asphalt pav., br. gut., limestone curb (new), old limestone curb reset, new rad. curb, Oneida St., from Astor to Jackson St.	17,588.68
16	Feb. 14, 1918.....	White Const. Co.....	Ctg., filg., asphalt pav., comb. cem. C. and G., 4th Ave., from Dakota to Montana.....	6,378.90
17	Feb. 14, 1918.....	White Const. Co.....	Grading, asphalt paving, comb. cem. curb and gutter, Sixth Ave., from Dakota to Montana.....	6,250.60
18	Feb. 14, 1918.....	F. P. Caughlin Co.....	Ctg., asphalt pav., new limestone curb, curb reset, br. gut., Martin St., from Jackson to Van Buren St.....	2,934.37
19	Feb. 14, 1918.....	White Construction Co.....	Ctg., asphalt pav., gutter paving, new limestone curb, old curb reset, new radius curb, Grove St., from Chicago Road to Lincoln Ave.....	5,262.56
20	Feb. 12, 1918.....	Retzlaff & Froemming.....	Ctg., filg., brick gut., bit. conc. paving, alley, bet. 2nd, 3rd, Locust and Chambers.....	3,224.08
21	Feb. 12, 1918.....	Wisconsin Construction Co.....	Ctg., brick gutter, bituminous conc. pav. alley, bet. 26th and 27th, Sts., Burleigh St. and Auer Ave.....	4,123.42
22	Feb. 12, 1918.....	Wisconsin Construction Co.....	Ctg., filg., br. gutter, bit. conc. paving, alley, bet. 23rd and 24th Sts., Townsend and Keefe Aves.....	1,491.52
23	Feb. 12, 1918.....	Retzlaff & Froemming.....	Ctg., brick gutter, bit. conc. pav., alley, bet. Locust and Chambers, Holton and Buffum.....	4,626.01
24	Feb. 12, 1918.....	Retzlaff & Froemming.....	Ctg., br. gutter, bit. conc. pav., alley, bet. Auer Ave., Concordia, Buffum and Richards Sts.....	2,760.57
25	Feb. 12, 1918.....	Wisconsin Construction Co.....	Ctg., br. gutter, bit. conc. pav., alley, bet. 11th and 12th Sts., Wells and Grand Ave.....	2,608.32
26	Feb. 12, 1918.....	Wisconsin Construction Co.....	Ctg., filg., br. gutter, bit. conc. paving, alley, bet. 40th and 41st, Center and Hadley.....	2,911.77

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
27	Feb. 12, 1918.....	Kroening Construction Co.....	Ctg., filg., old stone removed, brick pav., alley, bet. 1st, 2nd Aves., National Ave., and South Pierce.....	2,098.20
28	Feb. 12, 1918.....	Kroening Construction Co.....	Ctg., filg., pavemt. removed, creosote blk. pav., alley, bet. 3rd and 4th Sts., Grand and Wells.....	2,751.84
29	Feb. 12, 1918.....	Kroening Construction Co.....	Ctg., pavement removed, creosoted wood blk. pav., new limestone curb, new radius curb, old limestone curb rem., Everett St., from Fourth to Third Sts.....	6,984.90
30	Feb. 12, 1918.....	Frank Banaszak	Ctg., filg., br. gutter, pavement removed, bit. conc. pav., alley, bet. Hanover, Reed, Madison and Scott Sts., 5th Ward.....	1,743.68
31	Feb. 12, 1918.....	Ryback & Sadowski.....	Ctg., filg., br. gut., pavemt. rem., bit. conc. pav., alley, bet. Greenbush, Hanover, Madison and Scott.....	1,843.40
33	Feb. 12, 1918.....	Frank Banaszak.....	Ctg., filg., br. gutter, bit. conc. pavemt., alley, bet. Mitchell, Maple, 5th and 6th Aves.....	3,718.40
34	Feb. 12, 1918.....	Manger & McGucken Const. Co..	Pavemt. rem., stone block pavemt., limestone curb (new), old limestone curb rem., new radius curb, Sixth St., from Viaduct to Grand Ave, 4th Ward.....	7,293.65
35	Feb. 12, 1918.....	Manger & McGucken Const. Co....	Ctg., stone blk. pavmt., new straight curb, new radius sandstone curb, Detroit St., from Milwaukee to Van Buren Sts.....	24,739.58
36	Feb. 12, 1918.....	George Szerwinski.....	Pavmt., remov., sandstone block pavmt., new radius limestone curb, Chestnut St., from 9th to 11th and from 3rd to 9th Sts.....	22,128.99
37	Feb. 12, 1918.....	Manger & McGucken Const. Co....	Cedar blk. pavmt. rem., sandstone pavmt., new limestone curb, old curb reset, flg., Walnut St., from 3rd to 4th St.....	5,519.60
38	Feb. 12, 1918.....	John Weiher.....	Ctg., brick gutter, bit. conc. pavmt., alley bet. 10th and 11th, Concordia and Davis Sts., 25th ward.....	5,921.55

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
39	Feb. 12, 1918.....	Kroening Construction Co.....	Pavmt. rem., concrete foundation removed, creosote blk. pavmt., sandstone pavmt., straight curb, radius curb, old curb reset, new concrete foundation, 1st Ave., from Viaduct to Mineral St., 5th ward.....	32,165.65
40	Mar. 5, 1918.....	F. P. Caughlin Co.....	Ctg., asphalt pavmt., brick gutter, straight curb, curb reset, radius curb, Knapp St. from W. L. of Jefferson to W. L. of Milw. St..	6,028.71
41	Mar. 5, 1918.....	F. P. Caughlin Co.....	Ctg., asphalt paving, brick gutter, straight curb, curb reset, radius curb, Franklin Pl., from Ogden to 110 feet N. of Lyon St. and Warren Ave., from Franklin Place easterly.....	8,160.38
42	Mar. 5, 1918.....	Badger Construction Co.....	Ctg., asphalt paving, brick gutter, straight curb, curb reset, Cass St. from N. L. of Knapp to S. L. of Odgen Ave.....	4,501.30
43	Mar. 5, 1918.....	F. P. Caughlin Co.....	Grading, asphalt resurface, new pavmt. on concrete foundation, br. gutter, old conc. removed, curb reset, old curb rem. cem. sidewalke, Biddle St., from W. C. L. of Jefferson to E. C. L. of Milwaukee St.....	2,375.91
44	Mar. 5, 1918.....	White Construction Co.....	Old asphalt rem., asphalt resurface, Forest Home Ave., from Lincoln to 26th Ave.....	18,810.24
45	Mar. 5, 1918.....	White Construction Co.....	Ctg., asphalt pav., comb. curb & gutter, 27th Ave., from Lincoln Ave. south to Cemetery.....	6,510,45
46	Mar. 5, 1918.....	F. P. Caughlin Co.....	Ctg., flg., lt. traf. asphalt, comb. c. & g., 7th St., from Atkinson to n. l. of L. 1, bl. 1, Segnitz subdivision No. 1.....	4,163.82
47	Mar. 5, 1918.....	Badger Construction Co.....	Ctg., flg., lt. traf. asphalt, br. gut., straight curg, radius curb, side wlks., Auer Ave., from W. L. of 32nd St., to E. L. of 35th St.	10,007.99
48	Mar. 5, 1918.....	Badger Construction Co.....	Ctg., flg., lt. traf. asphalt, comc. cem. c. & gutter, sidewalks, 21st St.. from N. L. of Keefe Ave. to S. L. of Pease St.....	9,020.29

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
49	Mar. 5, 1918.....	R. H. Gumz.....	Ctg., flg., sandstone pavmt., sandstone curb, Jackson St., from N. L. of Buffalo St. to S. L. of Detroit St.....	8,937.15
55	Mar. 18, 1918.....	John S. O'Neill.....	Ctg., flg., bit. conc. pav., curb & gutter, sidewalke, 28th St., from S. L. of Concordia to S. L. of Townsend St.....	7,258.77
56	Mar. 18, 1918.....	George Czerwinski.....	Ctg., flg., cement concrete, alley bet. 7th and 8th, Prairie and Chestnut Sts., 2nd ward.....	954.20
57	Mar. 18, 1918.....	Kroening Construction Co.....	Ctg., cement concrete pav., alley betw. 40th and 41st Sts., Clarke and Center Sts.....	2,216.66
58	Mar. 18, 1918.....	Kroening Construction Co.....	Ctg., cement concrete paving, alley bet. 45th and 46th Sts., Wright and Clarke Sts.....	2,583.08
59	Mar. 18, 1918.....	Retzlaff & Froemming.....	Ctg., cement concrete, alley, 39th and 40th, North and Meinecke Ave.....	1,852.92
60	Mar. 18, 1918.....	Dean Construction Co.....	Flg., pavmt. removed, cement concrete, alley bet. Marshall, Cass, Pleasant and Kewaunee.....	1,460.06
61	Mar. 18, 1918.....	Kroening Construction Co.....	Ctg., cement concrete, alley betw. 41st, Grant Blvd., Clarke and Center Sts.....	2,213.26
62	Mar. 18, 1918.....	Retzlaff & Froemming.....	Ctg., cement conc., alley bet. 32nd and 33rd., Meinecke and Wright St.....	2,060.00
63	Mar. 18, 1918.....	F. W. Blodgett.....	Ctg., flg., bit. concrete, cement curb and gut., Rusk Ave. from Linebarger Terrace to Kinnickinnic Ave.....	8,219.56
64	Mar. 18, 1918.....	Roy B. Clayton.....	Ctg., flg., Bituminous concrete, br. gutter, straight curb and radius curb, Burrell St. from Lincoln Ave. to S. L. of Clarence St.....	14,449.86
65	Mar. 20, 1918.....	Badger Construction Co.....	Ctg., asphalt, Locust St. from W. L. of 35th St. to E. L. of 36th St.....	2,430.00

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
66	Mar. 20, 1918.....	Badger Construction Co.....	Ctg., asphalt, br. gutter, straight curb, radius curb, curb reset, 16th St., from S. L. of Prairie St. to S. L. of Vliet.....	18,760.36
67	Mar. 20, 1918.....	Badger Construction Company....	Ctg., pavmt. rem., asphalt, br. gutter, straight curb, curb reset, radius curb, 35th St., from S. L. of Pabst Ave. to S. L. of Center St.	27,987.02
68	Mar. 20, 1918.....	F. P. Caughlin Co.....	New concrete, pavement remv., asphalt pav., straight curb, curb reset, North Ave. from E. L. of 7th St. to W. L. of 12th St., 6th, 7th and 10th wards.....	11,931.44
69	Mar. 20, 1918.....	F. P. Caughlin Co.....	New concrete, pavement removed, asphalt pav., straight curb, curb reset, radius curb, North Ave., from W. L. of 12th St. to W. L. of West 24th St., 7th, 10th and 22nd wards.....	32,525.31
70	Mar. 20, 1918.....	White Construction Co.....	Ctg., flg., asphalt pav., curb and gut., Dakota St., from W. L. of 2nd Ave. to E. L. of Midland Ave. and from W. L. of 5th Ave. to E. L. of American Ave.....	26,396.90
71	Mar. 20, 1918.....	White Const. Co. (Assignee of Badger Const. Company).....	Ctg., flg., asphalt pav., curb and gutter, sidewalke, 24th Ave., from Mitchell St. to Burnham St.....	8,394.12
72	Mar. 20, 1918.....	White Const. Co.....	Ctg., asphalt, brick gutter, radius curb, 12th Ave., from Forest Home to Burnham St.....	2,664.70
73	Mar. 20, 1918.....	Milwaukee General Const. Co.....	Flg., stone removed, brick gutter, bit. conc., alley between Madison, Scott, Grove and Greenbush Sts.....	1,640.75
107	Apr. 8, 1918.....	F. P. Caughlin Co.....	Ctg., flg., asphalt, brick gutter, sandstone curb, radius curb, sidewalks, 3rd St., from S. L. of Becker Ave. to right of way of the C. M. & St. P. Ry.....	33,239.99

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
108	Apr. 8, 1918	F. P. Caughlin Co	Ctg., asphalt resurface, sandstone, asphalt, brick butter, straight curb, curb reset, radius curb, Burleigh St. (outside of Ry. zone) from E. L. of 5th St. south to E. L. of Louis Ave	29,981.23
109	Apr. 8, 1918	F. P. Caughlin Co	Ctg., asphalt pav., brick gutter, straight curb, curb reset, radius curb, Burleigh St., (outside of Ry. zone) from E. L. of Louis Ave. to E. L. of Teutonia Ave	9,722.04
110	Apr. 15, 1918	F. P. Caughlin Co	Ctg., flg., old pavmt. rem., asphalt pav., br. gut., conc. wall, curb reset, str. curb, radius curb, sidewlks. rem., Jefferson, from Biddle to Juneau Ave	9,283.62
111	Apr. 15, 1918	F. P. Caughlin Co	Ctg., flg., asphalt, br. gutter, sandstone curb, radius curb, sidewalks, Port Washington Road, from N. L. of Keefe to N. L. of Lake St	48,713.44
112	Apr. 8, 1918	Manger & McGucken Const. Co	Ctg., flg., old pavmt. remov., limestone pav., alley bet. West Water, 2nd Sts., Clybourn and Fowler Sts	5,948.30
113	Apr. 6, 1918	Milwaukee Gen'l. Const. Co	Ctg., cement concrete pavement, alley, blk. 10, Wells addition, bet. 17th and 18th, Prairie and Chestnut Sts	2,312.35
114	Apr. 6, 1918	Wisconsin Construction Co	Ctg., bit. conc. pav., brick gutter, straight curb, radius curb, curb reset, 18th Ave., from N. L. of Orchard St. to N. L. of Rogers	19,054.00
115	Apr. 6, 1918	Milwaukee Gen'l. Const. Co	Ctg., granite, straight curb, curb reset, Cold Spring Ave., from W. L. of 10th St. to E. L. of 11th St	5,141.20
117	Apr. 8, 1918	White Const. Co	Ctg., asphalt pav., brick gutter, straight curb, curb reset, radius curb, Virginia St., from Reed to Grove St	16.182.40
118	Apr. 8, 1918	Badger Construction Company	Ctg., flg., concrete removed, asphalt paving, curb and gutter, 2-course sidewalks, Burleigh St., from South Line of Burleigh and easterly line of Fond du Lac Ave. to easterly line of 43rd St	41,714.66

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
119	Apr. 15, 1918.....	George Czerwinski.....	New concrete, old pavement removed, radius curb reset, sandstone, radius curb, 3rd St., from south line of Cherry to north line of Cherry.....	1,628.41
133	Apr. 29, 1918.....	White Construction Co.....	Ctg., flg., asphalt, curb and gutter, 10th Ave., from S. L. of Dekota to N. L. of Oklahoma Ave.....	11,765.00
134	Apr. 29, 1918.....	White Construction Co.....	Ctg., asphalt, curb and gutter, 9th Ave., from S. L. of Dakota to N. L. of Oklahoma.....	14,638.60
135	Apr. 29, 1918.....	White Construction Co.....	Ctg., flg., asphalt, brck. gut., curb reset, 19th Ave., from N. L. of Rogers St. to N. L. of Grant St.....	18,260.70
147	May 28, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., cement concrete, alley bet. 29th, 33rd, State and Highland Blvd., 15th ward.....	4,593.96
148	May 27, 1918.....	F. P. Caughlin Co.....	Ctg., flg., asphalt pav., brick gutter, curb, sidewalks, concr. rem. Port Washington Rd., from N. L. of Lake to 120 feet north..	2,288.94
149	May 27, 1918.....	F. P. Caughlin Co.....	Ctg., flg., asphalt pav., curb and gutter, cement sidewalks, Hartford Ave., from W. L. of Downer Ave. to 956.22 ft. west of Downer	10,597.20
150	May 27, 1918.....	John Weiher.....	Ctg., bitum. concrete, curb and gutter, cem. sidewalks, Ellen St. from Kinnickinnic Ave. to S. L. of Oklahoma Ave.....	14,013.57
151	May 27, 1918.....	Frank Banaszak.....	Cement sidewalks, 4th Ave., from Montana to Dakota St.....	841.44
152	May 28, 1918.....	Dean Construction Co.....	Ctg., pavmt. remov., cement concrete pavmt., alley betw. 33rd and 34th Sts., Wright and Clarke Sts., 22nd ward.....	1,549.39
153	May 28, 1918.....	Dean Construction Co.....	Ctg., flg., cement concrete pavement, North alley, running east and west, and alley running north and south, and east half of south alley running E. & W., blk. 2, Reichert Subd. blk. 1, P. B. & L. A. Sub. No. 4, bet. 44th and 45th Sts., Elm and North Ave.	1,925.92

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
154	May 28, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., flg., cement con. pavement, alley, blk. 7, Pub. Pk. Land "A" Subd., bet. 46th & 47th Sts., Pabst and Elm Sts., 22nd ward...	2,502.58
155	May 28, 1918.....	Frank Schomann.....	Ctg., pavmt. remov., cem. conc. pavmt., alley bet. 25th and 26th Sts., Meinecke and Wright.....	2,809.49
156	May 28, 1918.....	Frank Schomann.....	Ctg., cem. conc. pavmt., alley betw. West 24th, 25th, Kilbourn and Meinecke Aves, 22nd ward.....	1,280.07
157	May 28, 1918.....	Frank Schomann.....	Ctg., pavmt. rem., cem. conc. pavement, alley, blk. 5, Columbia Park, bet. 33rd and 34th Sts., Lloyd and Elm Sts., 22nd ward..	1,952.65
158	May 28, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., cem. conc. pavement, alley betw. Grant Blvd., Sherman Blvd., Wright and Clarke Sts.....	2,618.60
159	May 28, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., cem. conc. pavmt., alley bet. 49th and 50th Sts., Vine and Pabst Ave.....	2,200.30
160	May 28, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., pavement removed, cement conc. pavmt., alley bet. 33rd and 34th Sts., Clark and Center Sts., 22nd ward.....	2,161.35
161	May 28, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., flg., cement conc. pavement, alley bet. 44th and 45th Sts., Clarke and Center Sts., 22nd ward.....	2,190.85
162	May 28, 1918.....	Frank Schomann.....	Ctg., paving removed, brick gutter, cement conc. paving, alley running N. & S. in blk. 2, Columbia Pk., bet. 33rd and 34th Sts., Elm and North Ave., 22nd ward.....	1,236.32
163	May 28, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., flg., cement concrete pavement, all alleys in blk. 9, Germania Park, bet. 29th and 30th Sts., Meinecke and Wright Sts.....	2,658.99
166	June 14, 1918.....	Badger Construction Co.....	Ctg., asphalt pav., brick gut., straight curb, curb reset, radius curb, Van Buren St., from n. l. of Ogden to s. l. of Brady St...	24,689.21

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
182	July 2 ,1918.....	Dean Construction Co.....	Ctg., flg., comb. cem. curb and gutter, cement sidewalks, Maryland Ave., from Kenwood Blvd. to Newport Ave.....	10,298.20
184	July 2, 1918.....	Retzlaff, Froemming & Bluhm....	Ctg., conc. cement pavement, alley bet. 37th and 38th Sts., Center and Hadley Sts.....	2,317.52
185	July 2, 1918.....	John Weiher.....	Ctg., Brick pavement, alley bet. 30th and 31st Sts., Concordia and Townsend	3,353.00
186	July 2, 1918.....	John Weiher.....	Ctg., flg., br. gutter paving, bit. conc., paving, alley bet. 39th and 40th Sts., Center and Hadley Sts.....	2,505.55
187	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Comb. cem. curb & gutter, cement sidewalks, east side of Cramer St., from Kenwood Blvd. to a point 614 feet north, and the intersection of Cramer St. and Concord Ave.....	905.19
188	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 44th and 45th Sts., North and Meinecke Aves.....	2,037.36
189	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., flg., cement conc. pav., alley bet. 25th and 26th Sts., North and Meinecke Aves.....	2,901.03
190	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 42nd St., Sherman Blvd., Pabst Ave., Eiring Place.....	1,120.88
191	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 32nd and 33rd Sts., Clarke and Center Sts.....	2,481.16
192	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Cutting, cement conc. paving, alley bet. 42nd St., Sherman Blvd., Eiring Place and Elm St.....	1,439.80
193	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 38th and 39th Sts., Meinecke and North Aves.....	2,556.48
194	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley betw. 31st and 32nd Sts., Elm St. and North Ave.....	1,282.16

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
195	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., flg., cement concrete paving, alley bet. 37th and 38th Sts., North and Meinecke Aves.....	2,345.32
196	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., flg., cement concrete paving, alley bet. 7th and 8th Aves., Arthur and Harrison Aves.....	2,409.60
197	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 24th and West 24th Sts., Center and Hadley Sts.....	3,222.10
198	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 34th and 35th Sts., Center and Hadley Sts.....	2,311.68
199	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 38th and 39th Sts., Center and Hadley Sts.....	2,104.08
200	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement conc. paving, alley bet. West 24th and 25th Sts. Prairie and Chestnut.....	1,402.05
201	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. Hayes and Arthur Aves., 5th and Midland.....	2,353.20
202	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 10th and 11th Sts., Cold Spring Ave. and Winnebago St.....	2,017.95
203	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., flg., cement concrete paving, alley bet. 26th and 27th Sts., Hadley and Locust.....	2,521.92
204	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. Pennsylvania Ave., Texas, Superior and Beulah.....	2,005.52
205	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cement concrete paving, alley bet. 26th and 27th Sts., Center and Hadley Sts.....	2,234.25
206	July 2, 1918.....	Milwaukee Gen'l. Const. Co.....	Ctg., cem. concrete paving, alley bet. West 24th and 25th Sts., Chestnut and Cold Spring Ave.....	2,143.26

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
214	July 17, 1918.....	Badger Construction Co.....	Ctg., flg., old pavmt. rem., S. S. asphalt pav., brick gutter pav. comb. cem. curb & gut., radius curb reset, cement sidewalks, Elm St., from Hi Mound Blvd. to 57th St.....	23,223.63
215	July 17, 1918.....	F. P. Caughlin Co.....	Ctg., S. Sheet asphalt, brick gutter paving, new straight limestone curb, old str. limestone curb rem., new radius curb, Martin St., from westerly line of Juneau Place to east line of Van Buren St.....	19,896.97
216	July 17, 1918.....	F. P. Caughlin Co.....	Ctg., asphalt pav., brick gutter pav., new stra. limestone curb, old stra. limestone curb removed, new radius curb Mason St., from E. L. of Jackson St. to westerly line of Juneau Pl.....	16,451.84
219	July 20, 1918.....	Badger Construction Co.....	Ctg., flg., asphalt paving, brick gutter, straight sandstone curb, new radius standstone curb, cement sidewalks, North Ave., from the E. L. of 53rd St. to the E. L. of 60th St.....	42,693.12
220	July 20, 1918.....	White Construction Co.....	Ctg., asphalt paving, comb. c. curb & gutter, cement sidewalks, flg., Pabst Ave., from E. L. of 56th St. to E. L. of Spring Ave., 60th St.....	19,307.30
221	July 20, 1918.....	R. H. Gumz (Assigned to White Construction Co.....	Ctg., bitum. conc. pav., brick gutter, new stra. limestone curb, old stra. limestone curb rem., new radius curb, 20th Ave., from S. L. of Mitchell St., to n. c. l. of Rogers St.....	14,150.62
222	July 20, 1918.....	John Weiher.....	Ctg., flg., bitum. conc. paving, comb. cem. curb and gutter, Concordia Ave., from W. L. of 27th St. to E. L. of 30th St.....	8,393.34
223	July 20, 1918... .	Kroening Construction Co.....	Ctg., old pavement rem., new creosote blk. pavement, Walnut St., from W. L. of 12th St. to E. L. of 13th St.....	4,782.40

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
224	July 20, 1918.....	White Construction Co.....	Asphalt paving, ctg., br. gutter paving, new straight limestone curb, old stra. limestone curb, new radius curb, Grove St., from S. L. of Chicago Road to Harrison Ave.....	13,319.14
225	July 20, 1918.....	White Construction Co.....	Old bitum. surface rem., new asphalt resurface, brick gutter, Walnut St., from E. L. of 13th St. to E. L. of West 24th St.....	24,322.57
226	July 20, 1918.....	White Construction Co.....	Ctg., old asphalt rem., standard sheet asphalt resurface, brick gutter, old curb reset, new radius curb, National Ave., from E. L. of 1st Ave to E. L. of 7th Ave.....	20,074.46
227	July 20, 1918.....	Badger Construction Co.....	Old bitum. resurface remov., asphalt resurface, brick gutter, Walnut St., from W. L. of 7th St. to E. L. of 12th St.....	11,476.69
228	July 20, 1918.....	John S. O'Neill.....	Ctg., flg., cem. concrete sidewalks, 22nd St., from Pease to Melvina St.....	2,312.30
229	July 22, 1918.....	Wisconsin Construction Co.....	Ctg., brick gutter, bitum. concrete pav., on a 5-inch foundation, alley betw. Center and Hadley Sts., Buffum and Richards Sts..	2,797.20
230	July 22, 1918.....	Frank Banaszak.....	Ctg., cement concrete paving, alley betw. 12th and 13th Aves., Forest Home Ave. and Bceher St.....	1,948.32
231	July 22, 1918.....	Frank Banaszak.....	Ctg., flg., cement concrete paving, alley bet. Becher and Grant Sts., and 20th and 21st Aves., 24th ward.....	2,530.71
232	July 22, 1918.....	Frank Banaszak.....	Ctg., concrete paving, alley blk. 6, part of blks. 4, 5 and 6 and all of blks. 7, 8 and 9, etc., between 27th and 28th Sts., Wright and Clarke Sts., 22nd ward.....	2,426.64
233	July 22, 1918.....	Frank Banaszak.....	Ctg., cem. conc. paving, alley in blk. 2 and 3, and part of blks. 4, 5, 6, etc., bet. 28th and 29th Sts., Wright and Clarke Sts.....	2,479.23
234	July 22, 1918.....	Wisconsin Const. Co.....	Ctg., cement conc. paving, alley bet. North Pierce, Fratney, Burleigh and Auer Ave.....	1,828.48

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
235	July 22, 1918.....	Frank Schomann.....	Ctg.. flg., cem. conc. pavement, alley bet. Fond du Lac Ave., Kilbourn Ave., Tamarack and Pine St.....	1,544.30
236	July 22, 1918.....	Frank Banaszak.....	Ctg., cem. conc. pavement, alley bet. Estes and Trowbridge Aves., Kinnickinnic and Delaware Aves.....	1,091.56
237	July 22, 1918.....	Frank Banaszak.....	Ctg., old cobblestone removed, cemnt. conc. pav., alley running northwesterly and southeasterly, in blk. 5, Lake View Park, bet. Dover and Otjen Sts., and just west of Kinninkinnic Ave., 17th ward.....	1,035.52
238	July 22, 1918.....	Dean Const. Co.....	Ctg., cement conc. pavement, alley bet 18th and 19th Sts., Prairie and Chestnut St.....	913.10
240	July 25, 1918.....	Badger Construction Company...	New concrete, old brick surface remov., S. S. asphalt resurface, old asphalt surface rem., extra binder, new straight limestone curb, 27th St.. from N. L. of Cedar St. to S. L. of Vliet St., in the 15th ward.....	16,650.05
246	Sept. 10, 1918.....	E. P. Caughlin Co.....	Standard sheet asphalt paving, Maryland Ave., from N. L. of Hartford Ave. to the S. L. of Newport Ave.....	5,739.90
248	Sept. 18, 1918.....	Badger Construction Co.....	Ctg., flg., new S. S. asphalt pavement, cem. curb and gutter, cem. C. & G. reset, new cement sidewalks, 51st St., from N. L. of Elm St. to S. L. of North Ave.....	4,551.81
253	Oct. 8, 1918.....	Manger & McGucken Co.....	Ctg., flg., concrete retaining wall, granite blk. paving, new cement sidewalks, 6th St., from S. L. of Grand Ave. to 6th St. Viaduct	5,407.00
254	Oct. 8, 1918.....	R. H. Gumz.....	Ctg., cement conc. paving, alley bet. 24th and 25th Aves., Greenfield Ave. and Scott St.....	2,552.40
138	May 9, 1918.....	Jos. B. Forrestal Company.....	Sewer in Pabst Ave., from 57th to 56th St.....	487.76

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
139	May 9, 1918.....	Jos. B. Forrestal Company.....	Sewer in Fernwood Ave., from Illionis Ave. to Vermont Ave., and in Vermont Ave., from a pt. 90 feet south of Fernwood Ave. to a point 240 feet north of Fernwood Ave.....	1,329.27
140	May 9, 1918.....	Jos. B. Forrestal Company.....	Sewer in Northwestern Ave., from Ellen St. to C. & N. W. Ry. right of way.....	661.92
141	May 9, 1918.....	W. T. Werner.....	Sewer in Elm St., from 57th St. to a point 120 feet east of 56th St., and 56th St., from a point 150 feet south of Elm St. to North Ave.....	2,207.04
142	May 9, 1918.....	W. T. Werner.....	Sewer in North Ave., from Spring Ave to 53rd St.....	6,571.49
143	May 9, 1918.....	George E. Zimmermann.....	Sewer in 38th St., from Burleigh to Locust Sts.....	2,969.64
144	May 9, 1918.....	George E. Zimmermann.....	Sewer in Dakota St., from American Ave. to 11th Ave.....	687.24
145	May 9, 1918.....	Arthur Kehrein.....	Sewer in Port Washington Road, from Lake St. to City Limits....	561.20
171	June 25, 1918.....	Jos. B. Forrestal Co.....	Sewer in Island Ave., from Lake St. to 120 feet south of Jefferson St.	3,891.12
172	June 25, 1918.....	Jos. B. Forrestal Co.....	Sewer in First St., from Lake St. to 123 feet south of Jefferson St.	4,936.12
173	June 25, 1918.....	W. T. Werner.....	Sewer in Mill St., from Port Washington Road to 8th St.....	1,329.86
249	Sept. 20, 1918.....	W. T. Werner.....	Sewer in 15th and 16th Sts., from Franklin St., extended, to Atkinson Ave.....	1,009.91
250	Sept. 20, 1918.....	W. T. Werner.....	Pipe, storm and sanitary sewer in 2nd St., from Lake St. to a point 180 feet south of Mill St.....	1,486.95
266	Oct. 28, 1918.....	Jos. B. Forrestal Co.....	Sewer in West 19th St., from Lake St. to a point 137 feet south of Franklin St., and Franklin St., from 17th to 21st St., and 20th St., from Franklin St. to a point 150 feet south of Franklink St., and Teutonia Ave., from Franklin St. to Nash St...	21,075.60

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
267	Oct. 28, 1918.....	M. Synovitz.....	Sewer in 14th St., from Lake St. to Atkinson Ave.....	3,783.70
268	Oct. 28, 1918.....	M. Synovitz.....	Sewer in 15th St., from Lake St. to Atkinson Ave.....	3,187.10
52	Mar. 22, 1918.....	Milwaukee Structural Steel Co....	Structural steel work, Humboldt Avenue Bridge, reconstruction....	6,240.00
53	Mar. 22, 1918.....	Thos. Siderits Const. Co.....	Concrete and stone work, Humboldt Avenue Bridge, reconstruction.	1,548.00
54	Mar. 22, 1918.....	Theodore L. Moritz.....	Brick setting, two boilers 5th Ave. Natatorium boiler room.....	984.00
120	Apr. 30, 1918.....	Wm. Lietz.....	Concrete work, Infirmary Bldg., Blue Mound Sanatorium.....	2,996.00
121	Apr. 30, 1918.....	J. F. Stephens.....	Lath and plaster work, Infirmary Bldg., Blue Mound Sanatorium....	1,030.00
122	Apr. 30, 1918.....	H. E. Schaetzke.....	Galvanized iron and tin work, Infirmary Bldg., B. M. Sanatorium..	273.00
123	Apr. 30, 1918.....	H. C. Kelling.....	Carpenter work, Infirmary Bldg., B. M. Sanatorium.....	5,300.00
124	Apr. 30, 1918.....	Wisconsin Decorating Co.....	Painting and glazing Infirmary Bldg., B. M. Sanatorium.....	900.00
125	Apr. 30, 1918.....	C. J. Fox.....	Heating Infirmary Bldg., B. M. Sanatorium.....	800.00
126	Apr. 30, 1918.....	Wenzel & Henoch Co.....	Plumbing and sewerage work, Infirmary Bldg., Blue Mound Sanatorium	2,179.00
136	May 7, 1918.....	Emil Grether.....	Mason work, Administration Bldg., Mitchell St., bet. 18th and 19th Aves	7,180.00
164	April, 1918.....	Lakeside Bridge & Steel Co.....	Two Tainter gates, etc., Milwaukee River dam.....	4,300.00
167	June 22, 1918.....	Milwaukee Gen'l. Const. Co.....	Mason work, Second Unit of Store House Bldg. at 1st Ave and East St.....	694.00
168	June 22, 1918.....	Milwaukee Gen'l. Const. Co.....	Concrete and cement work, Second Unit of Store House Bldg. at 1st Ave and East St.....	2,014.00
169	June 22, 1918.....	C. Hennecke Co.....	Cast and steel work, 2nd Unit Store House Bldg., 1st and East Sts.	278.00
170	June 22, 1918.....	H. E. Schaetzke.....	Galvanized iron and tin work, 2nd Unit Store House Bldg. at 1st Ave. and East St.....	287.00
208	July 12, 1918.....	Chas. Guetzkow.....	Carpenter work, Comfort Station, McKinley Beach.....	342.00
			Mason work, Comfort Station, McKinley Beach.....	463.00

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
210	July 12, 1918.....	Chas. Guetzkow.....	Concrete work, Comfort Station, McKinley Beach.....	236.00
211	July 12, 1918.....	Chas. Guetzkow.....	Painting and glazing work, Comfort Station, McKinley Beach....	66.00
212	July 12, 1918.....	Jos. Brah.....	Plumbing and sewerage work, Comfort Station, McKinley Beach....	865.00
213	July 12, 1918.....	H. J. Krauss & Son.....	Plastering Comfort Station, McKinley Beach.....	68.00
217	July 19, 1918.....	Paul E. Mueller Co.....	Heating, Natatorium, 5th and Hayes Aves.....	3,837.00
218	July 23, 1918.....	C. A. Kleppe.....	Bldg. tanks and flumes for Experimental Water Purification Plant.	8,282.00
239	July 26, 1918.....	T. M. Siesel.....	Concrete rail on west side of Reservoir Ave., from W. L. of Buffum to W. L. of Kilbourn Park.....	4,404.00
241	July 31, 1918.....	Paul E. Mueller Co.....	New heating boiler work, Children's Preventorium.....	700.00
243	Aug. 7, 1918.....	J. F. Stephens.....	Lath and plastering Administration Bldg., Isolation Hospital....	3,800.00
245	Aug. 29, 1918.....	F. W. Taddy.....	Concrete bridge across Kinnickinnic River, at Cleveland Ave.....	10,860.00
255	Oct. 10, 1918.....	Milwaukee Gen'l. Const. Co.....	Concrete work, laundry and kitchen, Isolation Hospital.....	4,561.00
256	Oct. 14, 1918.....	Riesen Bros.....	Mason work, laundry and kitchen, Isolation Hospital.....	1,590.00
257	Oct. 15, 1918.....	Wierdsma & Laatsch.....	Carpenter work, laundry and kitchen, Isolation Hospital.....	895.00
258	Oct. 10, 1918.....	Adolph Schumann.....	Galvanized Iron and tin work, laundry and kitchen, Isolation Hospital	434.00
259	Oct. 14, 1918.....	Earnest Jahn.....	Lath and plastering laundry and kitchen, Isolation Hospital.....	686.00
260	Oct. 25, 1918.....	Cream City Roofing & Pt. M. Co..	Roofing, laundry and kitchen, Isolation Hospital.....	390.00
261	Oct. 12, 1918.....	S. V. Hanley.....	Plumbing, laundry and kitchen, Isolation Hospital.....	1,275.00
262	Oct. 29, 1918.....	Wenzel & Henoch Co.....	Heating, laundry and kitchen, Isolation Hospital.....	1,372.00
264	Oct. 17, 1918.....	S. P. Croft.....	Grading, Filling, Graveling roadway, Blue Mound Sanatorium....	2,145.00
265	Oct. 24, 1918.....	Fred W. Zahn.....	Heating, Wagner & Allis cottages, Blue Mound Sanitarium.....	1,185.00
269	Nov. 16, 1918.....	H. J. Krauss & Son.....	Long span system of Pyro-Bar Gypsum roof tile, Municipal Incinerator Plant.....	1,195.00
271	Dec. 6, 1918.....	Great Lakes Dredge & Dock Co...	Furnishing and driving piles and repairing timbers on 14 bridges..	17,470.00

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
273	Dec. 23, 1918.....	Hackendahl & Schmidt Co.....	Six (6) steel cells and iron entrance doors, West Side Police station	1,518.00
274	Dec. 31, 1918.....	Cream City Roofing & Pt. M. Co.	Five Ply Security Asphalt Roofing, 6-in lap wide welded joint, City Hall	1,238.00
75	Mar. 27, 1918.....	Kinsella Transfer Co.....	Hauling and delivering water pipe, depot or dock, to pipe yard, etc.	1,795.00
76	Mar. 27, 1918.....	Jos. B. Forrestal Co.....	Laying water mains.....	33,897.60
50	Mar. 11, 1918.....	Wisconsin Dredge & Dock Co.....	Dredging the several rivers and canals in the City of Milwaukee...	25,000.00
51	Mar. 9, 1918.....	Welsbach Str. Lighting Co.....	Gas lighting service.....	15,000.00
77	Mar. 28, 1918.....	W. T. Werner.....	House drains and water connections, 18th Ave., from Orchard St. to Rogers St.....	606.20
78	Mar. 28, 1918.....	W. T. Werner.....	House drains and water connections in Galena St., from 20th to West 24th Sts.....	224.00
79	Mar. 28, 1918.....	W. T. Werner.....	House drains and water connections in 26th Ave., from Hayes to Forest Home Ave.....	151.20
80	Mar. 28, 1918.....	F. A. Goll.....	House drain and water connections in Lake Drive, from Windsor to North Ave.....	641.00
81	Mar. 28, 1918.....	F. A. Goll.....	House drain and water connections in Van Buren St., from Ogden to Brady Sts.....	296.20
82	Mar. 28, 1918.....	F. A. Goll.....	House drains and water connections in 13th St., from Cedar to Vliet Sts.....	53.50
83	Mar. 28, 1918.....	F. A. Goll.....	House drain and water connections in Auer Ave., from 32nd to 35th Sts	292.80
84	Mar. 28, 1918.....	George E. Zimmermann.....	House drain and water connections in 35th St., from Pabst to Center St.....	1,309.00

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
85	Mar. 28, 1918.....	George E. Zimmermann.....	House drain and water connections in Burleigh St., from Louis to Teutonia.....	582.00
86	Mar. 28, 1918.....	George E. Zimmermann.....	House drain and water connections in 19th Ave., from Rogers to Grant St.....	479.00
87	Mar. 28, 1918.....	George E. Zimmermann.....	House drain and water connections in 7th St., from Atkinson to Green Bay Ave.....	70.00
88	Mar. 28, 1918.....	George E. Zimmermann.....	House drain and water connections in Burleigh St., from 5th to Louis Ave.....	693.50
89	Mar. 28, 1918.....	George E. Zimmermann.....	House drain and water connections in Bremen St., from Concordia to Keefe Ave.....	2,581.20
90	Mar. 28, 1918.....	George E. Zimmermann.....	House drain and water connection in Port Washington Road, from Keefe to North City Limits.....	6,541.00
91	Mar. 30, 1918.....	Arthur Kehrein.....	House drain and water connections in Dakota St., from 2nd Ave. to 11th Ave.....	94.00
92	Mar. 30, 1918.....	W. T. Werner.....	House drain and water connections in 21st St., from Keefe Ave. to Pease St.....	1,115.00
93	Mar. 30, 1918.....	W. T. Werner.....	House drain and water connections in Burrell St., from Lincoln to Clarence St.....	728.40
94	Mar. 30, 1918.....	W. T. Werner.....	House drain and water connections in 22nd St., from Keefe Ave. to Herbert St.....	547.60
95	Mar. 30, 1918.....	W. T. Werner.....	House drain and water connections in 27th Ave., from Lincoln Ave. to Pilgrims' Rest Cemetery.....	295.15
96	Mar. 30, 1918.....	W. T. Werner.....	House drain and water connections in American Ave., from Dakota to Oklahoma Aves.....	2,582.55

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
97	Mar 30, 1918.....	F. A. Goll.....	House drain and water connections in Cherry St., from 10 to 11th. Sts.....	59.50
98	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections, 16th St., from Vliet St. to Fond du Lac Ave.....	305.80
99	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections in Elm St., from 50th to 57th St.	31.00
100	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections in Terrace Ave., from LaFayette to Wyoming Ave.....	355.60
101	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections in Cold Spring Ave., from 10th to 11th St.....	60.80
102	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections in 28th St., from Concordia Ave. to Townsend Ave.....	1,452.00
103	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections in Lisbon Ave., from 30th St. to Sherman Boulevard.....	2,787.80
104	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections in 3rd St., from Becker to right of way.....	4,878.50
105	Mar. 30, 1918.....	F. A. Goll.....	House drain and water connections in Rusk Ave., from Linebarger Terrace to Kinnickinnic Ave.....	1,081.00
106	Apr. 15, 1918.....	Mertis-Miller Co.....	Furnish labor, cartage, tools, etc., to install furnace flues on boilers of Fire Boat No. 15.....	9,550.00
127	Apr. 19, 1918.....	W. T. Werner.....	House drain and water connections in North Ave., from 53rd St. to Spring Ave.....	1,012.15
128	Apr. 19, 1918.....	W. T. Werner.....	House drain and water connections in Ellen St., from Kinnickinnic Ave. to Oklahoma Ave.....	526.30
129	Apr. 19, 1918.....	W. T. Werner.....	House drain and water connections in 20th Ave., from Mitchell to	

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
130	Apr. 19, 1918.....	W. T. Werner.....	House drain and water connections in 20th St., from Pease St. to Franklin St.....	991.40
131	Apr. 19, 1918.....	Wenzel & Henoch.....	House drain and water connections in Pabst Ave., from 56th to 60th St. (Spring Ave.).....	141.84
116	Apr. 11, 1918.....	W. F. Cumming.....	Install street lighting material—Mun. Str, Lighting system.....	95,000.00
146	May 20, 1918.....	Arthur Kehrein.....	House drain and water connections in Burleigh St., from 35th to 43rd St.....	675.50
174	June 27, 1918.....	W. T. Werner.....	House drain and water connections in 56th St., from Pabst to North Ave.....	1,319.40
175	June 27, 1918.....	F. A. Goll.....	House drain and water connections in 15th St., from State to Vliet St.....	92.40
176	June 27, 1918.....	F. A. Goll.....	House drain and water connection in 19th St., from Grand Ave. to Cedar St.....	89.00
177	June 27, 1918.....	George E. Zimmermann.....	House drain and water connection in 57th St., from Pabst to North Ave.	2,003.40
178	June 27, 1918.....	Arthur Kehrein.....	House drain and water connections in Townsend St., from 21st to 23rd Sts.....	451.00
179	June 27, 1918.....	W. T. Werner.....	House drain and water connections in Meinecke Ave., from 45th to 46th Sts.....	45.60
180	June 27, 1918.....	Arthur Kehrein.....	House drain and water connections, 55th St., from Elm St. to North Ave.....	608.00
207	July 10, 1918.....	Benj. Van Echteren.....	Construction five shelter sheds for Election Booths in various ward yards	2,925.00
242	July 30, 1918.....	Great Lakes Dredge & Dock Co..	Removing 25-feet breakwater and steel bridge across, etc.....	3,670.00
309	Jan. 9, 1918.....	Line Material Company.....	Coating street lighting fixtures.....	97,967.00

LIST OF CONTRACTS AWARDED DURING 1918—Continued.

Cont. No.	DATE	CONTRACTOR	WORK OR MATERIAL	AMOUNT
251	Sept. 30, 1918.....	Great Lakes Dredge & Dock Co..	Trench to contain electric conduits, crossing Milwaukee River, from Johnson to Prairie Sts.....	2,200.00
252	Sept 25, 1918.....	Arthur Kehrein.....	House drain and water connections in Maryland Ave., from Hartford to Kenwod Blvd.....	596.00
263	.....	Benj. Van Echteren.....	Construction six shelter shelds for election booths in various ward yards ($585.00 each).....	3,510.00
270	Aug. 2, 1918.....	Milwaukee Elec. Ry. & Lt. Co.....	Electric power to flush Milwaukee River 24 hours per day.....	

January 1, 1919

List of Permanent Pavements Upon
Which the Guarantee
Period Commences
in 1918

PERMANENT PAVEMENTS UNDER GUARANTEE.

An additional list of streets and alleys having permanent pavements, the guarantee period of same commencing during the year 1918, as follows:

CONTRACTOR	STREET	FROM	TO	Guarantee Limit. Yrs.	Kind Material	Expiration Guarantee
Kroening Const. Co	Alley, Blk. 14, 3rd Cont. of Boulevard Park, bet. 41st St. and Grant Blvd., Clarke and Center Sts			3	Cem. Conc.	June 8, 1921
Kroening Const. Co	Alley, Blk. 48, Walker's Point Add., bet. 1st and 2nd Aves., National Ave. and South Pierce St			5	Brick	May 21, 1923
Wisconsin Const. Co	Alley, Blk. 10, A. K. Mayhew Subd., Blk. 10, S. Heller's Sub., bet. 22nd and 23rd Sts., Locust and Chambers Sts			1	Bitum. Conc.	May 21, 1919
Wisconsin Const. Co	Alley, Blk. 5, Grand View and Peases Sub., bet. 26th and 27th Sts., Burleigh and Auer Ave			1	Bitum. Conc.	May 28, 1919
Wisconsin Const. Co	Alley Blk. 1, Lincoln Heights, bet. 23rd and 24th Sts., Townsend and Keefe Ave			1	Bitum. Conc.	May 29, 1919
Wisconsin Const. Co	Alley, Blk. 185, A. Eldred's Subd., bet. 11th and 12th Sts., Wells and Grand Avenue			1	Bitum. Conc.	May 21, 1919
Wisconsin Const. Co	Alley, Blk. 19, Residence Park, bet. 40th and 41st Sts., Center and Hadley Sts			1	Bitum. Conc.	May 31, 1919
John Weiher	Alley, Blk. 7, Milwaukee Savings Invest. Asso. Subd. No. 2, bet. 10th and 11th Sts., Concordia Ave. and Davis Sts			1	Bitum. Conc.	June 10, 1919
Retzlaff & Froemming	Alley, Blk. 1, Kurth's Sudb., Lands in S. W. ¼ Sec. of S. W. ¼ Sec., Blk. 1, Ullrich Subd. No. 2, bet. Auer and Concordia Aves., Richards and Buffum Sts			1	Bitum. Conc.	June 15, 1919
Retzlaff & Froemming	Alley, Blk. 1, Newberry Hill, and Blk. 1,. Continuation of Newberry Hill, bet. Linnwood and Kenwood, Oakland and Cramer Sts			1	Bitum. Conc.	June 7, 1919

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
Retzlaff & Froemming	Alley, Blk. 1, S. A. Richards' Add., Blk. 1, Sub. of south ½ of Blk. "E," Blk. 1, Subd. of N. ½ of Blk. "E," and Blk. 5, D. T. Brown Subd., of Blk. "F," etc., bet. 2nd and 3rd Sts., Locust and Chambers Sts			1	Bitum. Conc.	June 12, 1919
Retzlaff & Froemming	Alley, Blk. 75, Subd. of J. B. Smith, Subd. of Lot 61 and 62, Sec. 16, bet. Locust and Chambers Sts., and Holton and Buffum Sts.			1	Bitum. Conc.	June 13, 1919
Milwaukee General C. Co	Alley, Blk. 10, Wells Add., bet. 17th and 18th Sts., Prairie and Chestnut Sts			3	Cem. Conc.	June 13, 1921
Kroening Const. Co	Alley, Blk. 15, 3rd Cont. Blvd. Pk., bet. 40th and 41st Sts., Center and Clarke Sts			3	Cem. Conc.	June 22, 1921
Kroening Const. Co	Alley, Blk. 6, 1st Cont. of Jackson Park, bet. 45th and 46th Sts., Clarke and Center			3	Cement Conc.	June 25, 1921
Milwaukee Gen. Const. Co	Alley, Blk. 150, Huidekopers Subd., Wolcott Subd. and Subd. of N. 4 acres of the S. 12 acres, etc., bet. Grove and Greenbush, Mitchell and Lapham Sts			1	Bit. Conc.	June 26, 1919
Milwaukee Gen. Const. Co	Alley, Blk. 25, Milwaukee Proper, bet. Grove and Greenbush, Madison and Scott Sts			1	Bit. Conc.	June 25, 1919
Dean Const. Co	Alley, Blks. 53, 54, 55 and 56, Juneau Subd., bet. Marshall and Cass, Pleasant and Kewaunee Sts			3	Cement Conc.	July 10, 1921
Ryback & Sadowski	Alley, Blk. 24, Milwaukee Proper, bet. Greenbush and Hanover, Scott and Madison Sts			1	Bit. Conc.	June 26, 1919
Frank Banaszak	Alley, Blk. 6, Mitchell Subd., bet. Mitchell and Maple Sts., 5th and 6th Aves.			1	Bit. Conc.	July 2, 1919

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
Frank Banaszak	Alley, Blk. 23, Milwaukee Proper, bet. Hanover and Reed Sts., Madison and Scott Sts			1	Bit. Conc.	July 2, 1919
Dean Const. Co	Alley, Blk. 7, National Park Subd., bet. 23rd and 24th Aves., Scott and Greenfield Ave.			1	Bit. Conc.	June 25, 1919
Retzlaff, Froemming & Bluhm	Alley, Blk. 2, State Street Subd., Blk. 5, Subd. of Blk. 5, and Subd. of Lots 10 and 19 incl., 29th and 33rd Sts., State St. and Highland Blvd.			3	Cement Conc.	July 8, 1921
Retzlaff, Froemming & Bluhm	Alley, Blk. 3, Louis Subd., 32nd and 33rd St., Meinecke Ave. and Wright Sts.			3	Cement Conc.	July 8, 1921
Retzlaff, Froemming & Bluhm	Alley, Blk. 2, Hi Mount, bet. 49th and 50th Sts., Vine and Pabst Ave.			3	Cement Conc.	July 8, 1921
Frank Schomann	Alley, Blk. 1, Blvd. Park, bet. 39th and 40th Sts., North and Meinecke Aves.			3	Cement Conc.	July 16, 1921
Dean Const. Co	N. Alley running east and west and alley running north and south, and east ½ of south alley running east and west, Blk. 2, E. Reichertz Subd., etc., bet. 44th and 45th Sts., Elm and North Ave.			3	Cement Conc.	July 10, 1921
Retzlaff, Froemming & Bluhm	Alley, Blk. 12, Second Cont. Blvd. Park, bet. Grant and Sherman Blvds., Wright and Clarke Sts			3	Cement Conc.	July 31, 1921
Retzlaff, Froemming & Bluhm	Alley, Blk. 2, Prussion Heights, Blk. 8, Cont. of Lewis Subd., bet. 33rd and 34th Sts., Clarke and Center Sts			3	Cement Conc.	July 31, 1921
Milwaukee Gen. Const. Co	Alley, Blk. 1, Desmond's Subd. and Lands in N. W. ¼ Sec. 8, bet. Arthur and Hayes Aves., 5th and Midland Aves.			3	Cement Conc.	Sept. 10, 1921
Frank Schomann	Alley, Blk. 241, Dahlman and Kilian's Subd., bet. 25th and 26th Sts., Meinecke Ave. and Wright St.			3	Cement Conc.	Sept. 6, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET FROM TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
Retzlaff, Froemming & Bluhm...	Alley, Blk. 9, Germania Park, bet. 29th and 30th Sts., Meinecke Ave. and Wright St	3	Cement Conc..	Aug. 28, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. 17, Cont. of Mallory and Kern's Add., and Blk. 17, Assessment Subd., No. 4, bet. 31st and 32nd Sts., Elm and North Ave...	3	Cement Conc...	Sept. 26, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. No. 2, Sherman Park, bet. 37th and 38th Sts., North and Meinecke Aves	3	Cement Conc ..	Sept. 26, 1921
Retzlaff, Froemming & Bluhm...	Alley, Blk. 10, 2nd Cont. of Jackson Park, bet. 44th and 45th Sts., Clarke and Center Sts	3	Cement Conc...	Sept. 26, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. 2, Wellauer's Add. No. 1, etc., bet. 26th and 27th Sts., Hadley and Locust Sts	3	Cement Conc...	Oct. 12, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. 16, Rice's Subd., bet. 26th and 27th Sts., Center and Hadley Sts.	3	Cement Conc...	Oct. 12, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. 244, Dahlman and Kilian's Subd., bet. 25th and 26th Sts., North and Meinecke Aves	3	Cement Conc...	Oct. 17, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. 13, F. J. Helm's Subd., Lands., etc., bet. 24th and West 24th Sts., Hadley and Center Sts	3	Cement Conc ..	Oct. 17, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. 9, Lyndes' Add. No. 2, bet. West 24th and 25th Sts., Chestnut and Cold Spring Ave	3	Cement Conc...	Oct. 21, 1921
Milwaukee Gen. Const. Co.....	Alley, Blk. 271, Hawley's Subd., No. 2, bet. West 24th and 25th Sts., Prairie and Chestnut Sts	3	Cement Conc...	Oct. 21, 1921
John Weiher.....	Alley, Blk. 20, Residence Park, bet .39th and 40th Sts., Center and Hadley Sts.,	1	Bitum. Conc...	Aug. 28, 1919
Frank Banaszak.....	Alley, Blk. 3, Lake View Park, Dover and Otjen and west of Kinnickinnic Ave	3	Cement Conc...	Sept. 27, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
Frank Banaszak	Alley, blk. 6, Mitchell Subd., bet. Mitchell and Maple Sts., Fifth and Sixth Aves.			1	Bitum. Conc.	July 2, 1919
Frank Banaszak	Alley, Blk. 23, Milwaukee Proper, bet. Hanover and Reed Sts., Madison and Scott Sts.			1	Bitum. Conc.	June 27, 1919
Ryback & Sadowski	Alley, Blk. 24, Milwuakee Proper, bet. Greenbush and Hanover Sts., Scott and Madison Sts.			1	Bitum Conc.	June 26, 1919
Retzlaff, Froemming & Bluhm	Alley, Blk. 7, Pub. Park Land Asso. Subd., bet. 46th and 47th Sts., Pabst Ave. and Elm St.			3	Cement Conc.	Aug. 7, 1921
Dean Const. Co.	Alley, Blk. 3, Prussion Heights, and Blk. 5, Cont. of Lewis Subd., bet. 33rd and 34th Sts., Wright and Clarke Sts.			3	Cement Conc.	July 10, 1921
Frank Schomann	Alley, Blk. 240, Dahlmann & Kilian Subd., bet. West 24th and 25th Sts., Meinecke and Kilbourn Aves.			3	Cement Conc.	Aug. 8, 1921
Frank Schomann	Alley, Blk. 2, Columbia Pk., bet. 33rd and 34th Sts., Elm and North Ave.			3	Cement Conc.	Aug. 8, 1921
Frank Schomann	Alley, Blk. 5, Columbia Park, bet. 33rd and 34th Sts., Lloyd and Elm Sts.			3	Cement Conc.	Aug. 10, 1921
Milwaukee Gen. Const. Co.	Alley running E. and W. and North ½ of Alley running N. and S., Blk. 6, Grant Park, and Blk. 6, Subd. of Lot 7, etc., bet. 42nd St., and Sherman Blvd., Pabst Ave. and Eiring Place			3	Cement Conc.	Aug. 13, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 5, Grant Pk., Blk. 5, Sub. of Lot 7, Blk. 5 Lot 7, Blk. 6, and Lot 24, Blk. 4, Grant Pk., bet. 42nd St. and Sherman Blvd., Eiring Place and Elm St.			3	Cement Conc.	Aug. 13, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 2, Ewen's Subd., bet. 44th and 45th Sts., North and Meinecke Aves.			3	Cement Conc.	Aug. 13, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
Milwaukee Gen. Const. Co.	Alley, Blk. 3, Sherman Park, bet. 38th and 39th Sts., North and Meinecke Aves.			3	Cement Conc.	Aug. 26, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 2, Fuller Warren Heights, bet. 34th and 35th Sts., Center and Hadley Sts.			3	Cement Conc.	Aug. 26, 1921
John Weiher	Alley, Blk. 6, Forest Park, bet. 30th and 31st Sts., Concordia Ave. and Townsend St.			5	Brick	Aug. 28, 1923
Frank Schomann	Alley, Blk. 235, Dahlman and Kilian's Subd., bet. Fond du Lac and Kilbourn Aves., Tamarack and Pine Sts.			3	Cement Conc.	Aug. 29, 1921
Retzlaff, Froemming & Bluhm	Alley, Blk. 37, Residence Park No. 2, bet. 37th and 38th Sts., Center and Hadley Sts.			3	Cement Conc.	Aug. 23, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 7, Cont. of Lewis' Subd., bet. 32nd and 33rd Sts., Clarke and Center Sts.			3	Cement Conc.	Aug. 28, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 23, Lakeside Park No. 4, bet. Pennsylvania and Texas Aves., Superior St. and Beulah Ave.			3	Cement Conc.	Aug. 29, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 38, Residence Park No. 2, bet. 38th and 39th Sts., Center and Hadley Sts.			3	Cement Conc.	Aug. 28, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 8, Savings & Invest. Asso. of Milwaukee, Subd. No. 6, bet. 7th and 8th Aves., Arthur and Harrison Aves.			3	Cement Conc.	Sept. 10, 1921
Milwaukee Gen. Const. Co.	Alley, Blk. 121, bet. 10th and 11th Sts., Cold Spring Ave. and Winnebago Sts.			3	Cement Conc.	Oct. 24, 1921
Dean Const. Co.	South alley running east and west, Blk. 11, Wells Add., bet. 18th and 19th Sts., Prairie and Chestnut Sts.			3	Cement Conc.	Nov. 11, 1921
Frank Banaszak	Alley, Blk. 3, Hansen and Milbrath Subd. No. 1, bet. Estes and Trowbridge Aves., Kinnickinnic and Delaware Aves.			3	Cement Conc.	Oct. 4, 1921

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
Frank Banaszak	Alley, Blk. 1, Resubd. of L. F. Ullrich's Subd., Blk. 1, Freytag's Subd., Blk. 1, Cont. of Freytag's Subd. No. 4, Lands in S. E. ¼ Sec. 6, bet. 12th and 13th Aves, Forest Home and Becher St.			3	Cement Conc...	Oct. 19, 1921
Frank Banaszak	Alley, Blk. 6, Part of Blks. 4, 5 and 6, and all of Blks. 7, 8 and 9, being Part of Germania Park, in Blks. 2 and 3, etc., bet. 27th and 28th Sts., Wright and Clarke Sts.			3	Cement Conc...	Oct. 25, 1921
Frank Banaszak	Alley, Blk. 3, Miller's Subd., and Weide's Subd., bet. 20th and 21st Aves., Grant and Becher Sts.			3	Cement Conc...	Oct. 21, 1921
Frank Banaszak	Alley, Blk. 5, and Blk. 2 and 3, and part of Blks. 4, 5 and 6, being a part of Germania Park and part of Blks. 4, 5 and 6, etc., bet. 28th and 29th Sts., Wright and Clarke Sts.			3	Cement Conc...	Nov. 6, 1921
George Czerwinski	Alley, Blk. 160, bet. 7th and 8th Sts., Prairie and Chestnut Sts.			3	Cement Conc...	Aug. 1, 1921
Badger Const. Co.	Auer Ave.	32nd St.	35th St.	5	Asphalt	Sept. 18, 1923
F.. P. Caughlin Co	Biddle St.	E. C. L. Milwaukee...	W. C. L. Jefferson St..	5	Asphalt	June 10, 1923
Hoy B. Clayton	Burrell St.	Lincoln Ave.	Clarence	1	Bitum Conc...	July 11, 1919
F. P. Caughlin Co	Burleigh St.	Louis Ave.	Teutonia Ave.	5	Asphalt	Aug. 8, 1923
F. P. Caughlin Co	Burleigh St.	E.L. Louis Ave.	E. L. 5th St.	5	Asphalt	Aug. 12, 1923
Badger Const. Co	Burleigh St.	A pt. squared off from S. L. of Burleigh St. fr. Easterly line of Fond du Lac Ave...	E. L. 43rd St.	5	Asphalt	Sept. 4, 1923
F. P. Caughlin Co	Cramer St.	Kenwood Blvd.	Edgewood Ave.	5	Asphalt	Oct. 4, 1923
John Weiher	Concordia Ave.	27th St.	30th St.	1	Bitum. Conc...	Oct. 19, 1919

CONTRACTOR	STREET	FROM	TO	Guarantee Limt. Yrs.	Kind Material	Expiration Guarantee
White Const. Co	Dakota	2nd Ave	American Ave	5	Asphalt	July 30, 1923
Badger Const. Co.	Elm St	Hi Muont Blvd	57th St	5	Asphalt	Oct. 7, 1923
John Weiher	Ellen	Kinnickinnic Ave	Oklahoma Ave	1	Bitum. Conc.	Aug. 19, 1919
Wisconsin Const. Co	18th Ave	Orchard	Rogers	1	Bitum. Conc.	Sept. 18, 1919
White Const. Co	Forest Home Ave	26th Ave	Lincoln Ave	5	Asphalt	June 24, 1923
White Const. Co	4th Ave	Montana Ave	Dakota St	5	Asphalt	July 31, 1923
F. P. Caughlin Co	Fond du Lac Ave	North Ave	Wright St	5	Asphalt	Oct. 29, 1923
Badger Const. Co	53rd St	Pabst Ave	North Ave	5	Asphalt	July 31, 1923
White Const. Co	Grove St	Chicago Rd	Lincoln	5	Asphalt	Oct. 19
White Const. Co	Grove St	Chicago Rd	Harrison	5	Asphalt	Oct. 25, 1923
Badger Const. Co	Hadley St	W. C. L. 35th St	E. C. L. 36th St	5	Asphalt	Aug. 28, 1923
F. P. Caughlin Co	Hartford Ave	W. L. Downer	956.22'' W. Downer	5	Asphalt	Oct. 7, 1923
F. P. Caughlin Co	Hartford Ave	Oakland	956.22'' W. of Downer	5	Asphalt	Oct. 12, 1923
Badger Const. Co	Locust	W. L. 35th St	E. C. L. 36th	5	Asphalt	Aug. 17, 1923
Badger Const. Co	Lisbon Ave	W. L. 31st St	W. L. Sherman Blvd. to Lisbon Ave	5	Asphalt	Sept. 4, 1923
	Pabst Ave	L. 8, Blk. 6, Grant Pk.				
F. P. Caughlin Co	Maryland Ave	Hartford	Newport	5	Asphalt	Oct. 9, 1923
F. P. Caughlin Co	Norht Ave	E. L. 7th St	W. L. 12th St	5	Asphalt	July 11, 1923
White Const. Co	9th Ave	Dakota	Oklahoma Ave	5	Asphalt	July 30, 1923
F. P. Caughlin Co	North Ave	W. L. 12th St	W. L. West 24th	5	Asphalt	Aug. 7, 1923
White Const. Co	19th Ave	Rogers	Grant	5	Asphalt	Aug. 14, 1923
White Const. Co	National Ave	E. L. 1st Ave	E. L. Seventh Ave	5	Asphalt	Oct. 16, 1923
F. P. Caughlin Co	Oneida St	W. L. Astor	E. L. Jackson	5	Asphalt	June 10, 1923
F. P. Caughlin Co	Port Wahsington Rd	Lake St	120 ft. North	5	Asphalt	Sept. 13, 1923
F. P. Caughlin Co	Port Wahsington Rd	Keefe Ave	Lake St	5	Asphalt	Sept. 21, 1923
Frank W. Blodgett	Rusk Ave	Linebarger Terrace	Kinnickinnic Ave	1	Bitum. Conc.	June 28, 1919

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Yrs.	Kind Material	Expiration Guarantee
Badger Const. Co.	16th St.	S. L. Prairie	S. L. Vliet St.	5	Asphalt	June 14, 1923
White Const. Co.	6th Ave.	Montana	Dakota	5	Asphalt	July 31, 1923
F. P. Caughlin Co.	7th St.	N'ly L. Atkinson	N. L. Lot 1, Bl. 1, A. Segnitz Subd. No. 1.	5	Asphalt	July 31, 1923
White Const. Co.	27th Ave.	Lincoln Ave	S. to Cemetery	5	Asphalt	June 17, 1923
White Const. Co.	12th Ave.	Forest Home Ave.	Burnham St.	5	Asphalt	June 18, 1923
John S. O'Neill	28th St.	Concordia	Townsend	1	Bitum. Conc.	July 20, 1919
White Const. Co.	10th Ave.	Dakota	Oklahoma	5	Asphalt	July 30, 1923
Dean Const. Co.	26th Ave.	Hayes Ave.	Forest Home Ave.	1	Bitum. Conc.	Aug. 15, 1919
White Const. Co. (Assignee of Badger Const. Co.)	24th Ave.	Mitchell	Burnham	5	Asphalt	Aug. 10, 1923
Badger Const. Co.	35th St.	Pabst Ave.	Center	5	Asphalt	Aug. 15, 1923
Badger Const. Co.	27th St.	Cedar	State	5	Asphalt	Sept. 28, 1923
White Const. Co. (Assignee of R. H. Gumz)	20th Ave.	Mitchell	Rogers	1	Bitum. Conc.	Oct. 24, 1919
F. P. Caughlin Co.	3rd St.	Becker Ave.	R. of W. of C. M. & St. P. Ry. Co.	5	Asphalt	Oct. 31, 1923
White Const Co.	Virginia St.	Reed	Grove	5	Asphalt	Aug. 14, 1923
Badger Const. Co.	Van Buren St.	Ogden Ave.	Brady	5	Asphalt	Sept. 17, 1923
Badger Const. Co.	Walnut	7th	12th	5	Asphalt	Sept. 16, 1923
F. P. Caughlin Co.	Wisconsin	East Water	Broadway	5	Asphalt	Oct. 29, 1923
White Const. Co.	Walnut	13th	West 24th	5	Asphalt	Nov. 4, 1923

PERMITS ISSUED DURING THE YEAR ENDING DECEMBER 31, 1918.

1918	Excavations in Streets and Alleys		Deposit Building Material		House Drains		Storm Drains		Number of Extensions	Number of House Moving	Number of Miscellaneous
	No.	Amount	No.	Amount	No.	Amount	No.	Amount			
January	40	$ 40.00	15	$ 58.00	3	$ 6.00	...	.....	31	..	35
February	40	40.00	27	62.00	....	.....	...	.....	27	..	32
March	85	95.00	70	123.00	14	97.00	1	3.00	95	4	93
April	213	558.00	218	268.00	356	1,241.00	54	162.00	193	4	227
May	184	272.00	280	318.00	164	525.00	3	9.00	216	8	289
June	156	287.00	224	265.00	195	950.00	54	138.00	167	7	257
July	190	272.00	168	181.00	155	406.00	...	.....	143	7	217
August	115	192.00	144	146.00	35	215.00	1	3.00	144	3	237
September	114	199.00	121	127.00	89	438.00	85	255.00	130	2	152
October	109	112.00	80	92.00	24	119.00	1	3.00	75	1	152
November	86	87.00	31	40.00	17	191.00	3	9.00	49	1	106
December	72	75.00	18	20.00	13	31.00	2	6.00	95	..	64
	1404	$2,229.00	1396	$1,700.00	1065	$4,219.00	204	$ 588.00	1365	37	1861

Paid Permits issued	4,069
Free Permits issued	3,263
Total	7,332

Received for Excavation Permits	$2,229.00
Received for Deposit Building Materials Permits	1,700.00
Received for House Drain Permits	4,219.00
Received for Storm Drain Permits	588.00
Total	$8,736.00

Report

Assessment Department

Department of

Public Works, 1918

COMPARATIVE STATEMENT.

For what purpose—	Amount.
Total special assessments levied by the Department of Public Works for the year 1917	$678,398.36
Total special assessments levied by the Department of Public Works for the year 1918	723,793.58

GRAND RECAPITULATION

of special assessments for street and alley improvements, of street improvement bonds, of special assessments and water pipe assessments by the Department of Public Works.

For what purpose—	Amount.
Street improvement installments for 1918	$144,271.91
Street improvement installments for work prior to 1918	300,187.63
Special assessments for sewers	16,907.86
Special assessments for opening streets and alleys	5,088.08
Special assessments for vacating streets and alleys	9,060.00
Special assessments for laying water pipe	13,835.49
Special assessments for laying house drains and water connections	43,540.92
Special assessments for laying cement sidewalks	7,842.69
Special assessments for oiling streets	149,709.18
Special assessments for removing earth from sidewalks	444.79
Special assessments for cutting noxious weeds	5,739.66
Special assessments for removing snow from sidewalks	26,858.47
Special assessments for miscellaneous	306.90
TOTAL	$723,793.58

RECAPITULATION

of assessments levied by the Department of Public Works for stree and alley improvements during the year 1918.

WARD	Total Cost of 1918 Assessable Work	Installment for 191
First	$ 23,489.00	$ 3,914.8
Second	39,368.78	6,563.4
Third	36,803.69	6,178.4
Fourth	22,803.20	3,804.0
Fifth	44,835.30	7,472.8
Sixth	10,636.75	1,772.8
Seventh	22,616.59	3,769.5
Eighth	3,210.70	535.1
Ninth	14,867.08	2,477.9
Tenth	13,853.90	2,309.0
Eleventh	36,859.90	6,434.3
Twelfth	3,734.60	622.5
Thirteenth	.....	.....
Fourteenth	56,746.64	10,755.1
Fifteenth	11,941.80	1,990.3
Sixteenth	.....	.....
Seventeenth	44,432.93	7,405.7
Eighteenth	51,056.14	11,530.0
Nineteenth	18,377.15	3,069.6
Twentieth	65,509.68	15,663.4
Twenty-first	87,127.55	16,778.3
Twenty-second	109,381.64	18,231.2
Twenty-third	3,253.66	542.3
Twenty-fourth	41,889.34	6,991.9
Twenty-fifth	32,751.72	5,458.6
TOTAL AMOUNTS	$795,547.74	$144,271.9

RECAPITULATION

of assessments levied by the Department of Public Works for the construction of main sewers during the year 1918.

No. of Assessments	Amount
467	$16,907.8

OPENING AND EXTENSION OF STREETS AND ALLEYS.

The damages awarded for the property proposed to be taken in the several proceedings were $36,479.86, of which amount the sum of $5,088.08 was assessed as benefits to surrounding property, and $31,391.78 was chargeable to Street and Alley Opening Fund.

The benefits assessed for the property proposed to be vacated in he several proceedings were $9,064.00, of which amount the sum of $4.00 was awarded as damages and $9,060.00 was assessed as benefits o surrounding property.

The damages awarded for property proposed to be taken for videning and extending the Dover Street School Grounds, in the Seventeenth Ward were $3,500.00.

The damages awarded for property proposed to be taken for xtending the Thirteenth Avenue School Site, in the Twenty-fourth Ward were $4,250.00.

The damages awarded for property proposed to be taken for pening, widening and extending the South Menomonee Canal, in he Fifth Ward were $10,775.00.

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR OPENING STREETS AND ALLEYS.

Ward	STREET	FROM	TO	Damages Awarded for Property Taken	Benefits Assessed Against Property	Amount Chargeable to Street and Alley Opening Fund
18th & 21st	Locust St. / Folsom Place	Humboldt Ave and / Milwaukee River	Milwaukee River / Cambridge Ave.	$16,600.00		$16,600.00
19th	Alley between Galena a	nd Cherry Sts. and	West 24th and 25th Sts	381.85	381.85	
20th	Townsend St	24th St	West 24th	2,215.00	941.10	1,273.90
21st	Davis St	Green Bay Ave	Pt. Washington Rd	9,500.00	397.12	9,102.88
22nd	Elm St	45th St	Lisbon Ave	4,415.00		4,415.00
25th	Tenth St	Abert Place	Lake St	1,059.51	1,059.51	
25th	Eleventh St	Abert Place	Lake St	1,059.55	1,059.55	
25th	Twelfth St	Abert Place	Lake St	1,248.95	1,248.95	
			TOTALS	$36,479.86	$5,088.08	$31,391.78

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR VACATING STREETS AND ALLEYS.

Ward	STREET	FROM	TO	Benefits assessed against property	Damages awarded	Excess of benefits
5th	Walker St	East line of R. of W. of C. M. & St. P. Ry.	to Barclay St	$4,160.00	None	$4,160.00
6th	Ship St	Cape St.	to Green Bay Canal			
	Alley in Block 20	from Commerce St.	to Green Bay Canal, between Ship St. and Cherry St			
	Alley in Block 19	from Cape St.	to Green Bay Canal, between Ship St. and Cherry St			
	Alley in Block 16	from Cape St.	to Green Bay Canal, between Dock and Ship Sts	4,900.00	None	4,900.00
12th	Ziemer St	Becher St	Lincoln Avenue	2.00	$ 2.00	None
19th	55th St	Vine St	A point 72.72 ft. North of Vine St	2.00	2.00	None
			Total	$9,064.00	$ 4.00	$9,060.00

Report of the

Bureau of Street Construction and Repair

For the Year Ending

December 31,

1918

Mr. Percy Braman,

Deputy Commissioner of Public Works.

Dear Sir:

The following is a report of the Bureau of Street Construction nd Repair for the year ending December 31st, 1918.

The important street improvements in 1918 were the paving of t. Washington Road, from Keefe to north City Limits—the resurfacing of North Avenue, from 7th to W. 24th St., with an asphalt urface—the resurfacing of Forest Home Avenue, from Muskego ve. to 26th Ave., with an asphalt surface,—the paving of 35th treet, from Pabst Ave. to Center St., with a Standard Shet Asphalt avement—1st Avenue, from 6th St. Viaduct to Mineral St., with a reosoted Wood Block Pavement—widening and paving 6th Street, rom Grand Ave. to the 6th St. Viaduct, with a Granite Pavement—aving the north side of Chestnut Street, from 3rd to 11th St., with Hard Sandstone Pavement—also Detroit Street, from Milwaukee o Van Buren St., with a Hard Sandstone Pavement.

The improvement of Pt. Washington Road has greatly relieved affic conditions in this locality, because of the new pavement connecting with the County concrete road.

Our new concrete alley specifications which we put into effect ie beginning of the season of 1918 have proven most successful. Ve laid 56,095 square yards of this particular type of alley pavement in 1918 and will do fully 75,000 square yards of this work uring the season of 1919. The average cost of this alley work was 1.51 per square yard, which was a reasonable figure for 1918, considering the high cost of labor and material. I cannot say too much out the success of these concrete alleys, as they have far exceeded ir expectations and have become very popular, especially in the sidential sections of the city, owing to the low cost and the durality of the pavement.

We have been having considerable trouble with our Creosote ood Block Pavements, owing to the constant heaving of the block, pecially during the wet season. There is hardly a Creosote Block avement in the city which has not heaved more or less in places. find, upon investigation, that this condition prevails in various secons of the country where this material is used. I believe that ving to our peculiar climatic conditions that we are worse off than e majority of the sections of the country in this respect. I am ite enthusiastic where Creosote Wood Block Pavement is conrned as to the wearing quality of the material, but am a little disuraged with the conditions that have confronted us as above ated, and I begin to feel that Creosote Block Pavement in this secon will have to be eliminated in the future.

Taking the sason of 1918 as a whole, I feel satisfied that fr the standpoint of good work where all types of pavement are c cerned, that we have had a very successful season. This is due the co-operation of the various contractors, who have used eve effort to do the best work possible. I cannot say too much in co mendation of the effort made by the various contractors.

The following figures will give you an idea of the amount yardage of the various kinds of pavement laid, with the avera cost of each per square yard:

STREETS.

	Sq. Yds.	Average C
Asphalt Pavement	126,040.06	$2.43 sq.
Asphalt Resurface	81,282.81	1.66 sq.
Sandstone	13,833.36	3.49 sq.
Granite	6,488.51	3.32 sq.
Creosote Block	7,219.74	2.83 sq.
Bituminous Concrete	32,249.55	1.77 sq.

ALLEYS.

	Sq. Yds.	Average C
Cement Concrete	56,095.21	$1.51 sq.
Bituminous Concrete	18,990.03	1.91 sq.
Brick	1,713.90	2.50 sq.
Creosote Block	682.64	3.77 sq.
Limestone	1,372.74	3.75 sq.

REPAIR DIVISION.

The difference in cost of the repairs of the various types of pa ment in 1918 was very slight compared to 1917, as the figres bel will show. We did more asphalt repairing during 1918 than a previous year in the history of the city, and considering the increas cost of labor and materials, with the low price of 55c per squa yard, I am satisfied that we have been able to hold our cost to t minimum in this particular branch. This also applies to Blo Pavement repairs and to Bituminous Macadam Resurface work, the figures below will show.

We have made a number of improvements on our Asphalt Rep Plant, which will enable us to turn out a greater yardage than he tofore, at a lower cost. The work of remodeling these plants w done entirely by our own forces. We purchased considerable n equipment for the season 1919, such as road graders, new type iron heaters for asphalt work, also new type of tar kettle, which heated with an oil flame, the heat being regulated by a turn of a val We also purchased an additional motor truck, which will assist greatly in getting our material on the job where bituminous m adam resurface work is concerned.

The following is a set of figures showing the work accomplished the Repair Department,—the total cost of each branch and the st per square yard for the season 1918. I feel that owing to con-tions generally during 1918, that we have had one of the most ccessful seasons in the history of this department. We are pre-ring to beat this record in the season of 1919.

	Sq. yds.	Cost per sq. yd.
phalt Repairs	73,847	$0.558 sq. yd.
ck Pavement Repairs	41,648	.894 sq. yd.
uminous Macadam	256,214	.575 sq. yd.

Respectfully submitted,

C. J. VAN ETTA,
Supt. Street Constr. and Repair.

Department of Public Works

Bureau of Street Sanitation

Annual Report

1918

STATEME

Ward	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
	$

LIBRARY
OF THE
CITY OF BALTIMORE

STATEMENT OF SPECIAL ASSESSMENTS LEVIED DURING THE YEAR ENDING DECEMBER 31st, 1918.

Ward	Sewers	House drains and water connections	Water pipe	Repairing and constructing cement sidewalks	Oiling streets	Removing earth from sidewalks	Cutting noxious weeds	Removing snow from sidewalks	Opening streets and alleys	Vacating streets and alleys	Miscellaneous	Grand total	Ward
1	.....	$ 1,099.50	.....	$ 78.84	$ 5,207.02	.....	$ 201.00	$ 933.25	.....	.....	.....	$ 7,524.71	1
2	.....	206.70	.....	100.72	1,554.41	.....	.....	272.75	.....	.....	$ 5.10	2,134.58	2
3	.....	.....	.....	518.04	75.50	.....	26.00	1 844.05	.....	.....	2.20	2,465.79	3
4	.....	89.00	.....	372.92	1,142.15	.....	21.65	289.30	.....	.....	.....	1,915.02	4
5	.....	.....	.....	475.91	7,771.49	.....	14.40	255.25	.....	$4,160.00	6.76	12,683.81	5
6	.....	.....	.....	14.99	9,811.92	.....	17.00	190.00	.....	4,900.00	.....	14,933.91	6
7	.....	.....	.....	79.08	4,879.59	.....	7.00	165.80	.....	.....	.....	5,131.47	7
8	.....	.....	.....	.....	3,111.69	.....		169.37	.....	.....	.....	3,281.06	8
9	.....	650.25	.....	336.99	5,234.00	.....	4.75	70.21	.....	.....	129.27	6,425.47	9
10	.....	.....	.....	19.52	3,987.61	.....	9.60	108.36	.....	.....	79.20	4,204.29	10
11	.....	705.20	.....	331.15	8,789.27	42.10	133.50	1,373.10	.....	.....	.....	11,374.32	11
12	.....	.....	.....	149.22	2,108.03	.....	76.40	184.90	.....	.....	.....	2,518.55	12
13	.....	.....	.....	164.69	7,497.62	.....	46.75	411.20	.....	.....	.....	8,120.26	13
14	$ 169.61	2,648.55	$ 797.69	.....	4,376.91	12.00	202.20	2,189.41	.....	.....	10.76	10,407.13	14
15	.....	.....	.....	130.19	8,709.34	.....	96.35	425.20	.....	.....	.....	9,361.08	15
16	.....	.....	.....	44.98	8,359.08	.....	130.20	327.45	.....	.....	11.73	8,873.44	16
17	2,217.89	2,148.20	952.42	1,406.24	8,090.03	157.25	604.20	1,265.15	.....	.....	.....	16,841.38	17
18	.....	5,404.00	1,924.14	358.02	7,699.04	104.40	769.25	3,484.32	.....	.....	27.05	19,770.22	18
19	100.23	2,802.09	.....	720.82	10,535.03	.....	461.42	2,040.94	$ 381.85	.....	.....	17,042.38	19
20	1,974.40	3,654.78	4,699.28	590.16	4,965.59	.....	534.90	1,940.96	941.10	.....	1.46	19,302.63	20
21	4,612.30	13,676.60	2,738.87	.....	5,785.53	35.10	770.30	1,493.25	397.12	.....	27.25	29,536.32	21
22	6,861.76	6,146.70	303.28	1,357.29	10,967.36	.....	468.20	1,573.68	.....	.....	.80	27,679.07	22
23	.....	.....	.....	535.61	9,718.17	93.94	251.35	1,922.09	.....	.....	2.70	12,523.86	23
24	.....	928.65	.....	.....	2,743.55	.....	170.45	1,219.08	.....	.....	2.62	5,064.35	24
25	971.67	3,380.70	2,419.81	57.31	6,589.25	.....	722.79	2,709.40	3,368.01	.....	.....	20,218.94	25
	$16,907.86	$43,540.92	$13,835.49	$7,842.69	$149,709.18	$444.79	$5,739.66	$26,858.47	$5,088.08	$9,060.00	$306.90	$279,334.04	

Milwaukee, January 2nd, 1919.

Mr. Percy Braman,

Deputy Commissioner of Public Works,

Milwaukee, Wisconsin.

Dear Sir:

Following is the Annual Report of the Bureau of Street Sanitation for the year ending December 31st, 1918, showing detailed reports of the costs and statements of work performed:

Cleaning Streets and Alleys.
Ash and Rubbish Collection.
Garbage Collection.
Collection and Removal of Dead Animals.
Catch Basin Cleaning.
Sprinkling.
Flushing.
Minor Street Repairs.
Oiling.
Snow Removal.
Drinking Fountains.
Cutting Weeds.
Election Booths.
Miscellaneous Assessable Service.
Miscellaneous General Service.

CLEANING STREETS AND ALLEYS.

During the year 1918, there were 33,775 loads, or 101,326 cubic yards of sweepings removed.

The cost of cleaning streets and alleys for the entire season of 1918 was as follows:

Labor	$ 83,517.65
Team	47,164.32
Machine	2,201.43
Whitewing	60,603.13
TOTAL	$193,486.53

From January 1st, 1918, to September 9th, 1918, labor was paid at the rate of 35c per hour; from September 10th, 1918, to December 31st, 1918, at the rate of 42c per hour. Teams were rated at $6.00 per day.

ASH AND RUBBISH COLLECTION.

The following is a comparison of the yardage and cost of colle tion for the past eight years:

	Cost.
1918 Collection—356,786 cu. yds.	$281,995
1917 Collection—366,120 cu. yds.	266,905
1916 Collection—333,375 cu. yds.	216,496
1915 Collection—320,373 cu. yds.	211,939
1914 Collection—321,669 cu. yds.	226,219
1913 Collection—379,848 cu. yds.	225,421
1912 Collection—293,646 cu. yds.	229,344
1911 Collection—188,737 cu. yds.	174,619

Average cost per cubic yard:

1918	$0.79
1917	.70
1916	.65
1915	.66
1914	.70
1913	.70
1912	.78
1911	.93

The cost of 1918 as compared with that of 1911 shows a decrea of 14c per cubic yard.

Wages paid labor and teams were at the same rate as sho under the caption: CLEANING STREETS AND ALLEYS.

STATEMENT OF ASH AND RUBBISH COLLECTION.

1918.

MONTH	Cu. yds.	Total Co of Collecti
January	11,565	$ 10,464
February	43,625	37,271
March	64,377	50,716
April	61,301	47,608
May	39,160	30,610
June	21,563	18,062
July	10,411	9,099
August	5,844	5,197
September	7,964	7,432
October	25,090	13,013
November	29,831	20,467
December	36,055	32,051
	356,786	$281,995

Average cost of removal, per cubic yard, was $0.79.

GARBAGE COLLECTION.

The following are statements of garbage collection in 1918 and comparative costs per ton for the past seven years:

STATEMENT OF GARBAGE COLLECTION—1918.

MONTH	Loads	Tons	Cost of Collection
January	3,934	1,457	$ 8,745.75
February	3,956	1,508	8,788.50
March	4,799	2,088	10,644.75
April	5,444	2,403	12,080.25
May	5,560	2,730	12,287.25
June	6,161	3,008	13,938.75
July	6,581	3,204	14,852.25
August	6,841	3,423	15,223.50
September	6,336	3,104	14,064.75
October	6,773	3,128	15,007.50
November	6,037	2,794	13,353.75
December	5,553	2,474	12,287.25
TOTAL	67,975	31,321	$151,274.25

Average weight of load, 922 lbs.

Average cost of collection, per ton, $4.83.

STATEMENT OF COMPARATIVE COST PER TON IN THE PAST SEVEN YEARS.

1918	$4.83
1917	4.18
1916	3.07
1915	2.87
1914	2.94
1913	2.42
1912	2.47

The wages paid to the collectors were at the rate of $4.50 per day. Each collector must bring in two loads for a day's pay.

COLLECTION AND REMOVAL OF DEAD ANIMALS.

For this work we employ one permanent collector, and add a temporary collector during the warm months of the year. The wages paid were at the rate of $4.50 per day.

Following is a statement of the work performed:

MONTH	Small Animals	Large Animals	Total	Cost of Collectio
January	249	....	249	$ 117.0
February	254	....	254	108.0
March	336	....	336	121.5
April	370	....	370	117.0
May	382	....	382	121.5
June	368	....	368	229.5
July	412	....	412	238.5
August	409	....	409	243.0
September	302	....	302	166.5
October	313	....	313	121.5
November	253	....	253	117.0
December	255	....	255	117.0
TOTAL	3,903	....	3,903	$1,818.0

Average cost of collection per small animal was $0.47.

NOTE—Collector was paid $0.50 per day more in 1918 than in 1917. Also less animals were collected.

CATCH BASIN CLEANING.

The following is a statement of work done and itemized cost.

STATEMENT OF CATCH BASIN CLEANING DURING 1918.

MONTH	Total Cubic Yds. Removed	— Cost of Cleaning — Labor	Team	Total
January	....	.....	.....	.....
February	....	.....	.....	.....
March	....	$ 8.40	.....	$ 8.40
April	119	128.10	$ 82,50	210.60
May	1,101	985.35	600.00	1,585.35
June	2,033	1,751.40	940.50	2,691.90
July	3,184	2,439.44	1,276.50	3,715.94
August	2,729	1,966.18	903.00	2,869.18
September	1,962	1,498.14	556.50	5,054.64
October	2,408	2,089.85	729.00	2,818.85
November	931	988.68	311.25	1,299.93
December	219	311.44	51.00	362.44
TOTAL	14,686	$12,166.98	$5,450.25	$17,617.23

Average cost of cleaning and removing per cubic yard, $1.20.

SPRINKLING.

The following is a statement of the cost of street sprinkling.

anuary	
ebruary	
Iarch	$ 1,238.25
pril	2,883.00
Iay	4,133.25
une	8,737.50
uly	9,573.75
ugust	8,867.25
eptember	6,446.25
ctober	4,571.25
Tovember	709.50
ecember	
TOTAL	$47,160.00

202,771,979 gallons of water were used for sprinkling at a cost f $14,994.23. The charge for hydrant rent amounted to $9,387.50.

FLUSHING.

The following is a statement of the cost of street flushing.

MONTH	Labor	Team	Total
anuary			
ebruary	$ 22.40	$ 124.50	$ 146.90
Iarch	330.40	1,215.00	1,545.40
pril	343.00	1,533.00	1,876.00
ay	444.15	2,455.50	2,899.65
ne	891.30	3,145.50	4,036.80
ly	1,317.10	3,383.25	4,700.35
ugust	1,328.25	3 593.25	4,921.50
ptember	1,276.46	3,040.50	4,316.96
ctober	1,328.17	3,124.50	4,452.67
ovember	699.68	1,462.50	2,162.18
ecember		692.25	692.25
TOTAL	$7,980.91	$23,769.75	$31.750.66

95,228,500 gallons of water were used for flushing, costing $5,- 9.32. Hydrant rental charge amounted to $938.75.

MINOR STREET REPAIRS.

The cost of minor street repairs performed by this department as as follows:

Labor	$21,304.31
Team	9,541.49
Material	13,355.60
TOTAL	$44,201.40

This work consisted of emergency repairs of streets necessitated by cave-ins, washouts, etc.; repairing of defective gutters and 300 alley crossings; patching of 120 miles of water bound macadam road to place same in condition for oiling; raising of 6,000 feet of cobble stone gutters in places where these would become settled, making drainage impossible; removing 150 street crossings of brick or stone and placing macadam instead, thus making the intersections uniform.

We maintained between 6 and 7 miles of dirt roads with grading machinery and cinders; also in over 150 unimproved alleys, by the use of cinders, we made it possible for the property holders to approach garages with their machines through these alleys.

OILING.

During the season, 101 miles of streets were oiled. The total cost of oiling, including labor, team, oil and other materials, amounted to $172,237.52. Of this amount $149,709.18 was assessable, $89,825.33 for straight oiling and $59,883.85 for resurfacing and oiling macadam streets, and $22,528.34 for non-assessable.

The non-assessable portion was for oiling street and alley intersections and public property. The average rate of assessment per front foot was $.072. 1,067,435 gallons of oil were used. Contract price of oil was as follows:

Barber Asphalt Paving Company	$0.138
Barrett Manufacturing Company	0.1175

Following is a comparison of street oiling during the past ten years:

Year	Miles of Street Oiled	Cost
1909	3	$ 1,585.85
1910	16	5,435.42
1911	71	34,281.34
1912	28	7,120.90
1913	101	54,786.44
1914	114	53,480.26
1915	122	54,578.86
1916	146	108,965.31
1917	126	115,693.39
1918	101	172,237.52

SNOW REMOVAL.

The total cost of snow removal from streets, street intersections, crosswalks, gutters and private sidewalks was $166,865.00, divided as follows:

Removing of snow from private walks, or assessable service, $25,-
5.75.
City's portion for removing snow from streets, gutters and public
ılks: Labor $94,772.94. Team $46,896.31. Total $141,669.25.

DRINKING FOUNTAINS.

During the year $165.25 was spent for new equipment.
Three new bubblers were erected. $558.62 were spent for repairs
ıd $458.75 for maintenance during the year. Total cost of water
ıounted to $8,286.55. The total expense was $9,469.17.

CUTTING WEEDS.

Noxious weeds growing on private property are cut down when
cessary and the cost of this work is assessed against the property.
iis work is done by hand and machine.
During the last year $5,411.51 were spent for this purpose and
sessed against the property.

ELECTION BOOTHS.

This department handles all the election booths and equipment
r the Election Commission, whenever necessary, and the expense
same is paid for by said Commission.
The expense of erecting, maintaining and removing booths in
nnection with the Spring and Fall Elections (City, County, State
ıd National), also for the Military Registration held on September
th, amounted to $7,349.77.

MISCELLANEOUS ASSESSMENT SERVICE.

This service is assessed against the property affected, the cost
ing as follows:

moving earth from sidewalks, labor	$333.27
moving earth from sidewalks, team	222.75
ating nuisances, labor	203.65
ating nuisances, team	86.25
moving dead trees, labor	12.18
moving dead trees, team	2.62

PLOWING.

During the season of 1918, the Bureau of Street Sanitation took
ll charge of the preparation of the vacant lots for the Milwaukee
ty and County Agricultural Commission of which body I am a
ember. The Commission now owns five plows, five disks and two
rrows and with this equipment, this department plowed and har-
wed eight hundred vacant lots. Five hundred and thirty of these
re prepared for the gardeners at the actual cost of the labor. The
o hundred and seventy remaining were for worthy people and
re paid for by the Commission.

Besides these vacant lots there were also prepared for cultiva tion several large plots covering a total of over twenty-three acres The largest of these, nearly fifteen acres in size, was also piped i order that sufficient water might be had by all the gardeners.

This department also greatly aided both vacant lot and back yard gardeners by hauling to them over 4,500 loads of leaves and street sweepings to be used as fertilizer.

During the Fall and early Winter of 1918-1919, this departmen began work for the 1919 gardens by plowing the above mentioned and other large tracts to a total of twenty-six and one-half acres.

BAY VIEW ARTESIAN WELL.

To provide good drinking water for the citizens, an appropriatio was made in the budget for the purpose of reboring and repiping an artesian well located on Pryor Avenue, 120 feet west of Superio Street.

This work was done at a cost of $3,218.50.

We also procured permission from the Chicago, Milwaukee an St. Paul Railway and piped a natural spring from their right-of-wa to the public highway on Commerce Street, 350 feet south of Racin Street Bridge, putting this spring in condition for the public to fil three containers at one time and attaching a bubbler thereto.

At the west end of North Avenue Bridge, 100 feet north of Nort Avenue, we dug out an old spring, repiped and equipped it wit a filling attachment so that three people could procure spring wate at the same time. This was very much appreciated and heavily pa ronized during the period when our lake water was so affected i taste that no one cared to drink it.

DREDGING KINNICKINNIC RIVER.

In order to eliminate the overflowing of the Kinnickinnic Rive occurring every spring, the bed of this river was dredged betwee 1st and 10th Avenues.

The total cost of this work amounted to $1,235.74.

This also eliminated a very unsanitary condition by keeping th water running during the warm weather, when otherwise it woul become stagnant and create odors in a very thickly populated neigh borhood.

Respectfully submitted,

CHAS. O. DAVIS,
Supt., Bureau of Street Sanitation.

Report of

Bureau of Bridges and Public Buildings

1918

Milwaukee, Wis., March 31st, 1919.

Mr. Percy Braman,
Deputy Commissioner of Public Works,

Dear Sir:

Following is the annual report of the Bureau of Bridges & Public Buildings for the year 1918.

Construction activities have been limited somewhat by government restrictions made necessary by the war. Only the most urgent work was undertaken.

REPORT OF BRIDGE CONSTRUCTION.

Cherry Street Swing Bridge, which originally was designed to care for much lighter traffic than occurs at the present time, was strengthened. The old wooden floor beams were replaced by steel floor beams and stringers, and other minor repairs made. This structure should now be able to care for whatever traffic there may be across it within the next 10 years.

The Humboldt Avenue Bridge across the Milwaukee River in the Twenty-first Ward and the village of Shorewood was known to be in a dangerous condition. Considerable repairs were made to the abutements, new end span trusses were put in on both ends of the bridge, and the bridge raised and leveled to a point 2½ feet higher on the west end. A new floor system was also constructed, the County of Milwaukee agreeing to pay for half of these repairs.

It was not considered advisable to entirely rebuild this bridge as we expect within five years an entire new concrete bridge will be built near this point.

The dam across the Milwaukee River at North Avenue required somewhat extensive repairs during the past year. The spring breakup on the upper river was accompanied by unusually high water and heavy ice conditions which caused the old wooden gates and their piers to be carried away. New concrete piers were constructed, steel tainter gates and operating machinery installed, and a foot bridge erected to connect with the shore. Repairs were also made to the dam proper.

For several years repairs to bridge fender piling and protection piers had been confined to that which was the most essential. In consequence thereof, it has now become necessary to do an unusually large amount of this work. The contract has been let and such repairs are now being made as will place the bridges in good condition for some time. A large percentage of these repairs are not due to natural deterioration but to collisions with large boats. It is only where the more recently constructed bridges occur that the river channel is wide enough for present day navigation.

On the rubble mound breakwater at the foot of Wisconsin Street only a comparatively small amount of work was done. It is expected, however, that this project can be completed during the coming year.

A 25-foot gap was cut in the United States government breakwater near McKinley Park and bridged across. This was done to relieve the somewhat stagnant condition of the water at the bathing beach.

PROPOSED WORK.

This department has a considerable amount of bridge construction which should be done in the very near future.

When the west channel at Becher Street Bridge was dredged several years ago the short sheathing and piling under the abutment no longer served their intended purpose and the west abutment and approach began to slide into the river. This condition has now reached the point where the bridge may be placed out of commission at any time. Plans have been completed for a new abutment and it is intended to construct the same during the coming year.

It is expected to begin the construction of the new North Avenue Viaduct during the year 1919. This will be of reinforced concrete throughout, with the exception of three spans across the C., M. & St. P. tracks which will be of structural steel encased in concrete. The roadway will extend on a horizontal grade from the east side of Humboldt Avenue to a point just east of the C., M. & St. P. right of way. From this point it will slope down on a uniform slope to the present grade of Cambridge Avenue.

The construction of the new State Street Bridge is still held up through the objections of the Metropolitan Investment Company to building the structure on the lines proposed by this department. A movement is in progress to overcome these objections by making new plans which would place the proposed bridge on almost identically the same lines as the present swing structure. To adopt such a proposition would merely be perpetuating the mistakes of past years, which the city planning commission is now attempting to remedy at the expense of many millions of dollars. It would seem that the interests of the city at large demand that the bridge be constructed on the lines as already planned by this department.

A new Sixteenth Street Viaduct had been partially designed when it was considered advisable to await the adoption of plans by the city planning commission for the widening of 16th St. and 11th Ave. When this is done, plans for the viaduct, in conformty with the connecting streets, will be completed. In the meantime it will be necessary to make extensive repairs to that portion of the old viaduct over the C., M. & St. P. freight tracks.

Plans for the proposed Cedar Street Bridge are also being held back until the city planning commission can decide upon definite plans for the widening of Cedar and Biddle Streets.

A bond issue of $100,000.00 to cover repairs to Twenty-seventh Street Viaduct is to be voted on at the spring election. The concrete slab supporting the pavement on this structure was constructed at a time when concrete design was in its early stages and when traffic conditions were not as severe as at the present time. As a result the concrete has cracked and disintegrated to such an extent that when the heavy interurban street cars were allowed to cross this viaduct after Sixteenth Street Viaduct was declared dangerous, this concrete slab began to crumble and fall down in various places, more especially where the expansion joints are, the effect of the heavy cars being worse at this point. It has become dangerous to traffic and will have to be replaced.

BUILDING AND ARCHITECTURAL WORK.

South View Hospital.

The South View Isolation Hospital Administration Building contracts were let October 2nd, 1917. This building is designed to take care of the administrative offices, staff and help dining rooms, and the sleeping and living rooms for nurses. This building forms the connecting link between the east and west pavilions or wings and connects the system of service corridors. The amount paid on these contracts during the year will be found in Table No. 1.

The South View Isolation Hospital Laundry and Kitchen Building contracts were let October 10th, 1918. The building has progressed very satisfactorily and will be completed in advance of the larger Administration Building.

The Laundry and Kitchen contracts are for the building only. The laundry, kitchen and refrigerating equipment and apparatus will be let under separate contracts later.

Blue Mound Sanatorium.

The contracts for the Blue Mound Sanatorium Infirmary Building were let April 30th, 1918 and the work progressed very satisfactorily considering the labor conditions and material market. This building is designed to take care of the advanced cases, and forms an important and valuable addition to this institution. This building is equipped with all the modern sanitary safeguards and especial attention paid to the proper ventilation of wards.

During the construction an area in front of Infirmary was also graded so as to form a level square to the south of the building for landscape gardening purposes.

Roadway Within the Grounds.

Roadway contracts were let October 17th, 1918. Work was started at once and completed before winter weather set in. This roadway has a gravel top, which, after weathering through the winter I would advise covering with crushed limestone.

Heating.

Allis & Wagner Cottage heating contract was let October 24th 1918. These cottages were heated heretofore with small individual heating plants. The radiators were equipped with new automatic steam valves and each system connected to a new supply and return from the central heating plant, all properly laid in conduit, covered and trapped. This will result in the saving of fuel and the upkeep of individual plants.

Sewerage System.

A sewerage system was installed to take care of all present and future buildings. It is now complete with tht exception of the disposal plant. This system is connected to present old dry well which is not capable of taking care of the quantity of sewerage being run into it and a new, modern sewerage disposal plant must be installed.

We have prepared and have on hand plans for this new disposal plant.

Table No. 1 shows amounts paid for Dining Hall, Heating Plant and Water System. These payments were balnces held back the required time on contracts after completion, and paid in 1918.

Preventorium.

Contract for a new boiler was let on July 31st, 1918 and installed and the work completed by the time fires were needed in the fall, and other repairs made as requested by the Health Department.

Second Unit of Bridge Store House. . .

Contracts were let June 22nd, 1918. This unit was built as an addition to Unit No. 1 of the Bridge Store House. The construction is fireproof throughout and set on a floating concrete foundation.

Locker Building—Incinerator Plant.

The Locker Building for the Incinerator Plant was completed in 1917, but the steel lockers were contracted and paid for in 1918.

Lafayette Place Concrete Railing.

This railing was completed late in 1917, but final payment was made in 1918.

Reservoir Avenue Railing.

Contracts were let July 26th, 1918 for a solid ornamental reinforced concrete railing along Reservoir Avenue from a point on the west line of Buffum Street to the west line of Kilbourn Park. This railing forms a protection on the south line of Reservoir Avenue from the steep incline to the valley, which had been a menace to automobilists and the general public for some time.

Shelter Shed—Asphalt Plant.

A Shelter Shed was constructed for the Bureau of Street Construction as an addition to their asphalt plant which is located below the Sixteenth Street Viaduct near the approach.

Baby Pavilion.

The entire pavilion was repainted and a fence built enclosing the grounds between it and the lake, and other repairs attended to.

Central Market Scale House.

A Central Market Scale House was designed and plans and specifications completed, but work held back on government war work order.

Fifth Avenue Natatorium.

This natatorium was completed in 1918 and opened to the public. It is constructed with every modern improvement, including filtering and sterilizing apparatus for swimming pool.

This building is equal to the very best natatorium, both in arrangement and sanitary appointment.

City Hall.

A new composition roof for the City Hall was contracted for and let December 31st, 1918. The present tile roof, after being on this building since it was erected, became very leaky. This new roofing was designed to cover entire tile roof, giving a perfectly watertight surface to same.

West Side Police Station.

The six additional steel cells for the West Side Police Station on 12th and Sherman Streets were contracted for December 23rd, 1918, and will complete the cell room of this station.

Respectfully submitted,

DAVID McKEITH,
Acting Supt., Bridges & Public Buildings.

TABLE No. 1.

CONSUMPTION WORK.

Fifth Ave. Nat	$ 38,525.11
West Side Police Station	28,822.67
Blue Mound Sewerage	1,537.69
Blue Mound Administration	506.02
Blue Mound Heating Plant	6,538.07
Blue Mound Heating Plant, Allis & Wagner Cottages	1,226.46
Blue Mound Infirmary	12,964.93
Blue Mound Dining Hall	2,064.92
Blue Mound Water System	879.92
Blue Mound Roadways	1,405.77
Blue Mound Cottages	284.00
Isolation Hosp. Constr. and Painting	38,923.46
North Avenue Viaduct	1,990.45
State Street Bridge	55.97
Stone Breakwater	13,526.16
Storehouse—First and Second Units	5,667.91
Lockers—Incinerator	573.54
Lafayette Place Railing	791.99
Concrete Stairway—35th Street	594.70
Prot. Pier—Pleasant Street Bridge	2,774.00
Retaining Wall—Muskego Avenue	3,042.82
Reconstruct Humboldt Avenue Bridge	17,044.68
Reconstruct Cherry Street Bridge	8,090.08
Cleveland Avenue Conc	4,532.10
Comfort Station—McKinley Park	2,231.51
New Gates—North Avenue Dam	18,417.71
Reservoir Avenue Rail	4,572.90
Sixteenth Street Viaduct	307.19
Cut 25-foot Gap in Breakwater	3,705.10
Scale House—Central Market	190.66
Shelter Shed—Sixteenth Street Viaduct	1,012.19
Fence and Painting Infants' Pavilion	969.97
Pipe Storage Shed—Water Department	858.01
Becher Street Abutments	152.51
Extending Gas to McKinley Bath House	43.00
	224,824.17

Bascules	$ 64,5
Swing	32,5
Stationary	5,5
Gr. Total	$103,4

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

1918

TABLE SHOWING BOUNDARY LINES AND NUMBER OF INSPECTIONS MADE IN THE VARIOUS DIVISIONS OF THE CITY OF MILWAUKEE.

Boundary Lines of Districts

EAST DIVISION — All that part lying East of the Milwaukee River including the Village of Shorewood

WEST DIVISION.

All that part bounded South by the Menomonee River North by Galena St East by Milwaukee River, West to and including a part of Wauwatosa

All that part lying North of Clarke St. and West of 20th St

All that part lying West of 20th St. bounded on the South by Galena St and on the North by Clarke St

All that part lying North of Galena St bounded on the East by the Milwaukee River, and on the West by 7th St

SOUTH DIVISION

All that part lying West of 11th Av from the Menomonee River South to and including parts of West Milwaukee Town of Greenfield and Town of Lake

All that part lying between 1st and 11th Avs from the Menomonee River South to and including a part of Town of Lake

All that part lying East of 1st Av from the Menomonee River South to and including a part of Town of Lake

RECAPITULATION.

DIVISIONS	EAST DIVISION	WEST DIVISION.															SOUTH DIVISION												RECAPITULATION.									
INSPECTORS	Wm Smith	P. J. King.					Edw Wettig.					A G. Barsch.					L A Mehner					W. G Nern					J J Hotsch					A W Starck					* F C Balbi J S. Savage.										
MONTHS	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Plumbing Inspected.	Drain Inspected.	Plumbing Rejected.	Drain Rejected.	Cost Per Inspection.	Total Plumbing Inspections.	Total Drain Inspections	Total Inspections.	Total Plumbing Rejections	Total Drain Rejections	Total Rejections	Percentage Plumbing Rejections	Percentage Drain Rejections.	Percentage Total Rejections	Average Time, Minutes, Per Inspection	Average Monthly Cost Per Inspection	Total Cost Per Month
January 4	81	19	3	1	1.22	41	8	9	..	2.48	32	4	8	2	3 38	24	5	5	..	4.18	62	7	11	2	1.78	31	7	1	..	3 11	44	5	1	..	4.05	20	10	1	..	4 .05	48	15	12	2	1 94	373	80	453	51	7	58	1 94	.087	128	1 02	2.42	$ 1.095 24
February	69	3	5	..	1.70	42	7	6	2	2.46	33	5	7	..	3.20	36	10	6	2	2.66	33	5	7	..	3.19	30	4	3	1	3 55	65	15	3	2	1.53	18	3	..	..	5 76	66	21	16	1	1 52	485	73	459	53	8	61	137	109	143	56	2 48	1.096 68
March	127	41	12	3	.74	92	30	11	3	1.01	45	50	8	2	1.29	51	41	6	2	1.33	59	28	8	5	1.42	55	21	9	1	1 61	59	38	11	6	1 26	29	8	2	..	3 30	86	45	14	3	.95	603	302	905	81	25	105	134	.082	117	40	1 22	1.108 04
April	124	82	15	..	.61	96	103	17	1	.63	47	89	8	2	.91	59	73	10	11	.93	40	108	8	18	.84	74	47	6	..	1 00	71	133	8	9	61	81	65	4	..	.85	52	61	9	7	1 09	644	761	1405	85	48	133	132	.063	.094	36	0 79	1.115 52
May	128	78	9	3	6 07	108	56	13	..	.758	59	102	11	8	.767	89	111	23	6	.618	104	247	21	30	.357	89	44	15	..	.928	94	175	5	10	464	91	81	4	1	.726	61	58	10	4	1 041	823	952	1775	111	62	174	131	.065	.097	34	0 64	1.119 56
June	77	37	6	1	1.077	68	32	14	3	1.229	75	99	15	4	.713	95	93	22	1	.661	123	127	11	17	.505	97	60	..	3	.798	87	138	11	3	.554	62	67	10	3	.965	78	71	4	1	702	762	724	1486	93	36	129	122	.049	.086	35	0.73	1.099.94
July	128	77	15	2	.614	111	78	9	1	.67	99	93	20	9	.649	110	64	16	3	.719	156	105	37	6	.489	53	34	4	..	1.418	92	113	14	3	.609	45	23	5	1	1.852	114	112	9	1	468	906	699	1605	129	25	154	142	.045	.095	34	0 69	1.106 95
August	99	112	6	5	.644	110	59	9	1	.80	36	59	1	3	1.396	85	183	8	11	.503	76	56	10	4	1 03	68	112	15	..	.758	37	37	8	1	1.783	64	56	8	2	1.07	99	89	2	..	614	680	763	1443	67	26	93	098	.034	.064	.46	0 83	1.193 60
September	101	39	9	1	.967	91	79	7	1	.789	63	115	8	7	.754	37	27	7	1	2.058	60	63	10	6	1.096	86	74	11	1	.839	66	63	6	4	1.038	76	51	7	1	1 179	54	43	1	..	1 178	624	554	1175	66	22	88	106	.038	.075	37	1 01	1.187 65
October	95	32	14	2	1.062	133	71	11	4	.666	102	69	16	2	.788	78	30	22	2	1.247	53	41	8	6	1.426	87	98	5	1	.729	29	62	3	..	1.46	56	54	5	..	1 224	65	74	..	..	831	698	531	1229	84	17	101	120	.032	.082	42	0 92	1.192 35
November	67	71	5	2	.981	85	38	7	1	1.095	52	66	5	1	1.136	43	79	8	2	1.102	59	38	13	3	1.384	39	41	2	2	1.658	51	36	6	..	1.529	36	28	2	..	2.081	67	33	5	1	1 145	499	430	929	53	11	64	106	.026	.068	45	1.27	1.186 30
December	97	47	4	4	.938	119	33	17	4	.884	52	83	10	2	.995	46	72	7	2	1.138	60	74	9	3	1.005	63	38	16	2	1 326	63	38	16	2	1.966	32	16	3	1	2.767	64	36	4	1	1 138	579	420	999	78	19	97	145	.045	.097	44	1 19	1.185 00
Total Plumbing Inspt	1193	..	..	..	..	1096	..	..	..	..	695	..	..	..	..	753	..	..	..	..	885	..	..	..	..	755	..	..	..	..	748	..	..	..	..	601	..	..	..	..	848	..	..	..	..	7574	..	..	..	..	..	..	..	..	..	..	..	..
Total Drain Inspt	..	638	..	..	..	..	594	..	..	..	..	834	..	..	..	..	788	..	..	..	..	899	..	..	..	..	563	..	..	..	..	853	..	..	..	..	462	..	..	..	..	658	..	..	..	..	6289	..	..	..	..	..	..	..	..	..	..	..	..
Total Plumbing Reject	..	..	103	..	..	..	..	130	..	..	..	..	117	..	..	..	..	140	..	..	..	..	153	..	..	..	..	79	..	..	..	..	92	..	..	..	..	51	..	..	..	..	86	..	..	..	..	951	..	..	..	..	..	..	..	..	..	..	..	..
Total Drain Reject	..	..	..	24	..	..	..	..	21	..	..	..	..	42	..	..	..	..	43	..	..	..	..	100	..	..	..	..	9	..	..	..	..	39	..	..	..	..	9	..	..	..	..	19	..	..	..	..	306	..	..	..	..	..	..	..	..	..	..	..	..
Percentage Plumbing Reject	..	.086	..	..	..	..	.118	..	..	..	..	.168	..	..	..	..	.185	..	..	..	..	173	..	..	..	..	.104	..	..	..	..	.123	..	..	..	..	.085	..	..	..	..	1 01	..	..	..	..	125	..	..	..	..	..	..	..	..	..	..	..	..
Percentage Drain Reject	..	..	.038	..	..	..	..	.035	..	..	..	..	.05	..	..	..	..	.055	..	..	..	..	112	..	..	..	..	..	.016	..	..	..	.046	..	..	..	..	.019	..	..	..	..	.029	..	..	..	..	.048	..	..	..	..	..	..	..	..	..	..	..	..
Percentage Total Reject	..	..	.069	..	..	..	..	.089	..	..	..	..	104	..	..	..	..	.119	..	..	..	..	.142	..	..	..	..	..	.067	..	..	..	.082	..	..	..	..	.056	..	..	..	..	.070	..	..	..	..	..	..	..	..	..	.09	..	..	..	..	..	..	..	..
Average Time Min. Per Inspt	..	..	..	40.1	..	..	..	..	36.4	..	..	..	..	41.4	..	..	..	..	42	..	..	..	..	26.7	..	..	..	..	38.7	..	..	..	34.7	..	..	..	..	64.1	..	..	..	..	40.7	..	..	..	..	..	..	..	..	..	329	..	..	..	..	..	..	..	..
Average Cost Per Inspection	..	..	..	..	.844	..	..	..	..	.911	..	..	..	..	1.002	..	..	..	..	.995	..	..	..	..	.872	..	..	..	..	1.16	..	..	..	..	.956	..	..	..	..	1.32	..	..	..	..	1 02	..	..	..	..	..	..	..	..	..	.987	..	..	..	..	..	..	..	..
Total Per Year	1838	..	127	..	..	1690	151	..	..	..	1529	159	..	..	..	1541	183	..	..	..	1784	253	..	..	..	1318	88	..	..	..	1601	131	..	..	..	1063	60	..	..	..	1506	105	..	..	..	13863	1257	..	..	..	..	..	..	..	..	..	..	..	$13,686.23

ANNUAL REPORT
of the Superintendent of
PLUMBING AND HOUSE DRAIN LAYING

Milwaukee, Jan. 23rd, 1919.

Mr Percy Braman,
Comm. of Public Works

Dear Sir:

I respectfully submit herewith the annual report of the Department of Plumbing and House Drain Laying for the year ending Dec 31st, 1918. The attached Table shows the division of the City into nine districts and the number of men employed.

I wish to thank Miss Anna Goodsitt in appreciation for services rendered this department as stenographer during the year

Respectfully submitted.

GEO R. STOLZ,
Superintendent.

DIVISIONS.	Plans Approved.	Plans Cancelled.			Plans Disposed of by Completion and Cancellation.					Unfinished Plans.				
		1918	1917	1915	1918	1917	1916	1915	1913	1918	1917	1916	1915	1913
West	1382	9	2	1	1163	315	7	4	..	219	21	..	1	..
East	280	2	..	..	253	63	5	..	1	27	8	..	..	..
South	741	4	1	..	647	119	5	..	..	94	12	2	2	2
Town Lake	10	..	..	..	9	1	1	..	..	1	..	..	..	..
Shorewood	45	..	1	..	39	27	..	..	..	6	16	2	..	..
West Milwaukee	23	..	..	..	21	5	..	..	..	2	..	..	..	..
Town Greenfield	16	..	..	..	14	5	..	..	..	2	..	..	..	..
Town Wauwatosa	38	..	..	..	26	8	..	..	..	12	..	..	..	..
Total	2535	15	4	1	2170	543	18	4	1	363	57	4	3	2

ORGANIZATION.

Superintendent of Plumbing and House Drains	$ 2,040.00
Deputy Superintendent of Plumbing and House Drains	1,680.00
Nine Field Inspectors	13,270.00
Transportation, Street Car Fare	416.66
Junior Clerk Stenographer	36.77
Total	$17,443.43

* In Military Service.

On May 23rd, 1918, Mr. F. C. Balbi entered the U. S. Navy and his District has been filled by Mr. J. S. Savage during the interim.

TABLE No. 2.

	Operation	Roadway Repairs	Sidewalk Repairs	Machinery Repairs	Superstructure Repairs	Substructure Repairs	House Repairs	Electrical Repairs	Miscellaneous Repairs	Maintenance Total	Grand Total
Bascules .	$ 64,914.14	$1,246.33	$ 171.11	$1,904.83	$616.64	$528.52	$278.04	$1,791.00	$288.18	$ 6,824.65	$ 71,738.79
Swing ...	32,954.41	1,079.25	444.67	548.67	262.34	240.16	189.18	411.46	211.68	3,387.41	36,341.82
Stationary	5,570.21	2,002.44	2,379.05	.....	114.39	.....	11.16	64.60	70.29	4,641.93	10,212.14
Gr. Total	$103,438.76	$4,328.02	$2,994.83	$2,453.50	$993.37	$768.68	$478.38	$2,267.06	$570.15	$14,853.99	$118,292.75

BRIDGE REPAIRS.

Wig-Wag Signals	$ 111.79
Machinery Repairs	537.82
Roadways and Sidewalks Replaced	10,039 80
Steel Repairs	1,288.34
Repairs to Bridges where damaged by vessels	1,297.08
Painting	3,943.90
Protection Pier	27.17
Tools and Equipment Repairs	119.93
	$17,365.83

TABLE No. 3.

CITY HALL COSTS.

	Total	Unit of Measure	No. of Units	Unit Cost
Heat	$16,335.89	Sq. ft. Radiation Surface	22,220	$0.735
Electricity—Switch Board Cost	13,772.23	K. W. Hours	326,879	0.042
Elevators	19,770.73	Elevator Miles	27,740	0.712
Cleaning and Caretaking	17,929.26	Sq. ft. Office Space	100,250	0.178
Electric Lighting—Maintenance	2,849.64			
Plumbing System	444.13			
General Operation	7,753.47			
Miscellaneous Repairs	5,687.76			
		Sq. ft. Office Space	100,250	$0.843
TOTAL	$84,543.11			

TABLE No. 4.

NATATORIUMS AND BATHING BEACHES.

	General Operation	Heat	Repairs	Gross	Receipts	Net	Attendance	Cost Per Bather
Center	$ 3,461.52	$ 3,025.51	$2,176.41	$ 8,663.44	$ 790.25	$ 7,873.19	60,012	$0.131
Jackson	3,492.32	3,271.05	342.63	7,106.00	1,015.85	6,090.15	63,920	.095
Greenbush	4,514.88	3,664.68	196.91	8,376.37	2,030.40	6,072.97	83,404	.073
Greenfield	4,688.26	3,546.86	421.12	8,656.24	1,845.55	6,810.69	93,337	.073
North Ave.	4.770.52	3,386.56	650.55	8,807.63	1,017.10	7,790.53	90,098	.086
Prairie	4.953.29	4,381.05	911.53	10,245.87	2,203.65	8,042.22	81,260	.099
Fifth Ave.	*1,319.35	787.01	.....	2,106.36	79.39	2.026.97	3,986	...
McKinley	5,616.44	.....	1,453.59	7,070.03	1,305.40	5.764.63	54.294	.106
South Shore	4,909.87	.....	163.04	5,072.91	607.40	4.465 51.	39,073	.114
TOTAL	$37,726.45	$22,062.72	$6,315.68	$66,104.85	$11.167.99	$54,936.86	569,384	$0.094

*Note—The cost of operation for Fifth Ave. includes an item of $811.48 which was spent to equip this new natatorium with furniture, bathing suits, and towels. There was also considerable money spent in cleaning and getting natatorium in shape for bathers. The attendance of 3,986 is for 1½ months of running, whereas the expenditures were for a period of 3 months. Therefore the cost per bather is not included in above table.

TABLE No. 5.

MUNICIPAL GARAGE.

Cost of New Equipment	$14,054
Cost of Operation	6,798
Cost of Maintenance—Charged to Cars Directly	25,836
Repairs to Garage	193
TOTAL	$ 46,882
Total Mileage for all Cars under Garage Management	261.352 mi

TABLE No. 6.

MISCELLANEOUS COSTS.

Danger Lights R. R. Bridges 18th Ward	$ 179
Comfort Station	416
Central Market	2,263
Work for Other Dept	7,057
Odd Jobs	1,366
TOTAL	$11,283

SUMMARY.

Construction	$224,824
Bridge Operation and Maintenance	118,292
Bridge Repairs	17,365
City Hall	84,543
Bathing Stations	66,104
Municipal Garage	46,882
Miscellaneous	11,283
TOTAL	$569,297
Total Overhead	17,638
Overhead Percentage	3.

Report of
City Engineer

For the Year Ending

December 31, 1918

January 8th, 1919.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

In compliance with the requirements of the City Charter, I herewith submit to you the report of the operations of the Bureau of Engineers for the year ending December 31st, 1918.

BUREAU OF ENGINEERS.

GENERAL OFFICE.

George F. Staal	City Engineer
Edward F. Petersik	Principal Clerk
Daisy Vojtik	Clerk-Stenographer

ENGINEERING DIVSION.

Ed. F. Leidel	Chief Engineer
Fred Hornbach	Senior Engineer
Irvin L. Knebes	Senior Engineer
James C. Berenson	Senior Engineer
Wm. F. Hunt	Senior Engineer
John G. Baumgartner	Asst. Civil Engineer
Harry Nelson	Asst. Civil Engineer
August F. Bussian	Asst. Civil Engineer
Joseph Richter	Asst. Civil Engineer
Gustav A. Uhlmann	Asst. Structural Designer
Bruno P. Schaefer	Engineering Draftsman
Fred W. Schultz	Map Engineering Draftsman
Joseph Sikorra	Map Engineering Draftsman
Frank Nahrath	Chief Engineering Estimator
Oscar Ludovici	Engineering Estimator
George Eigner, Jr	Engineering Estimator
Leon Glasgow	Junior Engineer
Fred. W. Banholzer	Junior Engineer
Elden Fensel	Rodman
Louis Klabunde	Rodman
Theo. Wittemann	Rodman
Alois Weiand	Rodman
Lawrence Paape	Rodman
Theo. Gauger	Rodman
Robert La Philliph	Rodman

STREETS AND ALLEYS.

The length of streets and alleys improved during the year 191 are as follows:

Streets improved	16,945 mil
Streets paved	12,425 mil
Alleys paved	8,398 mil

The total cost of streets and alley improvements amounted t $1,137,040.47, of which amount $815,883.75 was assessed against abut ting property as benefits. The improvements made and the cos thereof are shown by the following statement:

STREET IMPROVEMENTS.

Excavation	76,427.00 cu. yds.	$ 79,606.4
Filling	21,638.00 cu. yds.	13,325.8
Asphalt pavement	145,206.01 sq. yds.	352,657.7
Asphalt top removed	71.101.11 sq. yds.	21,880.2
Asphalt resurfaced	73.079.65 sq. yds.	121,154.4
Asphalt pavement removed	3,532.16 sq. yds.	2,295.4
Bituminous concrete pavement	37,404.02 sq. yds.	66,028.0
Bituminous top removed	5,462.99 sq. yds.	1,912.0
Brick repaved	33.32 sq. yds.	24.9
Brick pavement removed	13,959.50 sq. yds.	5,333.8
Brick gutter	14,578.87 sq. yds.	42,031.9
Sandstone pavement	9,367.11 sq. yds.	31,578.6
Sandstone pavement removed	5,283.82 sq. yds.	1,373.7
Granite pavement	17,882.49 sq. yds.	63,378.1
Creosoted wood block pavement	7.219.74 sq. yds.	20,499.9
Stone pavement removed	2,499.39 sq. yds.	882.8
Cedar block pavement removed	6,301.89 sq. yds.	1,362.5
Brick gutter removed	66.89 sq. yds.	2.3
Cement concrete pavement removed	6,576.13 sq. yds.	2,623.9
Cement concrete	1,760.22 cu. yds.	11,923.0
Extra binder	58,281.35 cu. ft.	17,484.4
Stone curb	29,671.07 lin. ft.	30,804.7
Stone curb reset	26,424 85 lin. ft.	4,562.2
Radius stone curb	4,899.81 lin. ft.	6,095.6
Cement curb and gutter	44.914.68 lin. ft.	27,849.2
Cement curb	558.97 lin. ft.	345.9
Cement gutter	287.00 lin. ft.	177.2
Cement curb and gutter reset	165.80 lin. ft.	107.7
Cement curb and gutter removed	173.10 lin. ft.	17.3
Cement walk	214.688.13 sq. ft.	33,109.6
Cement walk removed	1.408.75 sq. ft.	203.7
		$960,644.9

ALLEY IMPROVEMENTS.

Excavation	19,536.00 cu. yds.	$ 25,715.25
Filling	1,166.00 cu. yds.	1,425.99
Bituminous concrete pavement	18,990.03 sq. yds.	36,356.16
Brick gutter	1,808.46 sq. yds.	5,830.42
Cement concrete pavement	55,851.11 sq. yds.	84.475.04
Stone pavement removed	220.28 sq. yds.	113.96
Brick pavement	1,713.43 sq. yds.	4.298.15
Cobblestone pavement removed	6,838.93 sq. yds.	2,552.96
Creosoted wood block pavement	682.64 sq. yds.	2,573.55
Brick pavement removed	115.13 sq. yds.	63.54
Limestone pavement	1,372.74 sq. yds.	5,147.78
		$168 552.80

WORK DONE BY CITY CREWS.

Cement walks	29,427.43 sq. ft.	
Cement driveway	1,043.44 sq. ft.	
Cement walk reset	1,786.16 sq. ft.	
Cement steps	22.00 sq. ft.	
Cement curb	313.53 lin. ft.	$ 7,842.69
Cement curb and gutter	1,365.25 lin. ft.	
Cement gutter	66.50 lin. ft.	
Cement curb reset	114.00 lin. ft.	
GRAND TOTAL		$1,137,040.47

Table showing miles of the various pavements taken up and laid during the year 1918, and the total miles of paved streets at the end of years 1917 and 1918:

Kind of Pavement.	Miles taken up during 1918	Miles laid during 1918	Total miles at end of 1917	Total miles at end of 1918
Asphalt	0.16950	8.69804	120.53901	129.06755
Brick	0.96505	0.	24.19372	23.22867
Granite block	0.09040	0.82368	11.13080	11.86408
Sandstone block	0.27102	0.50242	10.14174	10.37314
Creosote wood block	0.	0.44353	11.15617	11.59970
Bituminous concrete	0.34129	1.95738	8.47464	10.09073
Cement concrete	0.	0.	0.99601	0 99601
TOTAL	1.83726	12.42505	186.63209	197.21988
Macadam	4.62521	0.	235.26979	230.64458
GRAND TOTAL	6.46247	12.42505	421.90188	427.86446

MILES OF ALLEY PAVEMENT.

Total length of alleys paved during 1918	8.39750 mi
Total length of alley pavement removed during 1918	0.96743 mi
	7.43007 mi
Total length of alleys paved at the end of 1917	128.73680 mi
Total length of alleys paved at the end of 1918	136.16687 mi

At the end of the year 1918 there were 492.70 miles of stree within the city limits, of which 427.864 miles are improved a 64.836 miles are unimproved.

LENGTH OF STREETS.

At the end of the year 1917, the total length of streets in the Ci of Milwaukee amounted to 491.28 miles.

During the year 1918 there were added:

By platting	1.41 mi
By condemnation	.29 mi
By dedication	.03 mi
	1.73 mi
Minus vacations	.31 mi
Total of new streets	1.42 mi
Total at the end of 1917	491.28 mi
Total at the end of 1918	492.70 mi

WATER PIPE.

Plans and profiles were made, line and grade given for layi 11,348 feet, or 2.149 miles of water pipe, of sizes ranging from s to sixteen inches in diameter, as follows:

8,225 lineal feet of 6 inch pipe
252 lineal feet of 6 inch hydrant pipe
2,008 lineal feet of 8 inch pipe
863 lineal feet of 16 inch pipe

11,348 feet

A complete report of the costs of the laying of water pipe, et will be found in the report of the Superintendent of Water Works.

STAGE OF WATER IN RIVERS AND LAKE DURING 1918.

	Highest	Lowest	Mea
January	+0.2	—0.6	—0.1
February	+0.3	—0.3	—0.1

Iarch	+1.3	—0.1	+0.156
pril	+0.7	—0.1	+0.273
Iay	+0.9	+0.2	+0.386
une	+0.6	+0.2	+0.35
uly	+1.1	+0.4	+0.662
ugust	+1.1	+0.4	+0.695
eptember	+1.1	—0.4	+0.353
)ctober	+0.4	—0.5	—0.103
Tovemebr	+0.4	—0.6	—0.189
)ecember	+0.1	—0.6	—0.192
Highest		+1.3	
Lowest		—0.6	
Average Mean		+0.173	

	Highest	Lowest	Mean
)18	+1.3	—0.6	+0.173
)17	+3.0	—0.8	+0.0864
)16	+0.4	—1.1	—0.349
)15	0.0	—1.2	—0.6105
)14	+0.2	—1.5	—0.489
)13	+0.3	—1.5	—0.6119
)12	+1.7	—2.9	—0.7939
)11	—0.6	—2.9	—1.809
)10	—0.3	—2.6	—1.497
)09	+0.8	—3.0	—0.242
)08	—1.1	—1.5	—0.482
:07	+1.0	—1.1	+0.960
:06	+1.1	—0.9	+0.070
:05	+1.0	—1.2	—0.020
04	+1.5	—1.36	—0.140
03	+0.23	—1.73	—0.660
02	0.0	—2.2	—1.010
01	+0.4	—1.9	—1.690
00	—1.1	—2.3	—0.940
99	+0.4	—2.2	—0.900
98	0.0	—2.7	—0.980
97	—0.1	—2.3	—1.160
96	—0.1	—2.8	—1.810

VACATIONS AND CONDEMNATIONS OF LAND.

Maps and descriptions of lands proposed to be condemned for ghway or other purposes were made, also for the vacations of streets id alleys, as follows:

CONDEMNATIONS	WARD
orth and south alley between 29th, 30th, Fond du Lac avenue and Locust street	20
venth street, from Green Bay avenue to Lake street	21

Howell and Russell avenue intersection
North and south alley, between Sixth and Seventh streets and between Mil and Jefferson streets
North and south alley between Port Washington road and Sixth street and between Mill and Jefferson streets
Seventeenth street, from Davis to Lake streets
Eighteenth street, from Davis to Lake streets
Nineteenth street, from Teutonia avenue to Lake Street
Abert place, from Twelfth street to Louis avenue
Eleventh street, from Abert place to Atkinson avenue
Sixteenth street, from Franklin street to Lake street
Franklin street, from Nineteenth to Sixteenth streets
Ische place, from Vienna avenue to Keefe avenue
Third street, from Mill to Lake street
Becker avenue, from Second to Third streets
Jefferson street, from Seventh street to Port Washington road
Eighth street, from Green Bay avenue to Lake street
Abert place, from Green Bay avenue to Seventh street
Part of bed of Milwaukee river between State and Martin streets
Estes street, from Ellen street to Kinnickinnic avenue
North and south alley, Block 95
High School site, Block 1, 2, 3, 4, Abert Heights
Arthur avenue, from Greenbush street to Chicago road
Eleventh avenue, from Cleveland to Oklahoma avenue

VACATIONS.

Allen street, from E line Allis Subd. No. 2 to Allis street
All alleys Block 1, H. G. Comstock's Subdivision
Parts of Davidson, Virginia and S. Pierce streets
Northeast and southwest alley, Block 5, Bay View Brick & Real Estate Co.'s Subdivision

There were no street name changes made during the year 191

AREA OF CITY, January 1st 1919—25.85 square miles—

Land—25.332 square miles; water 0.518 square miles.

The area of the city January 1st, 1900	21.15 square m
The area of the city January 1st, 1905	22.37 square m
The area of the city January 1st, 1910	22.63 square m
The area of the city January 1st, 1915	25.72 square m
The area of the city January 1st, 1916	25.85 square m
The area of the city January 1st, 1917	25.85 square m
The area of the city January 1st, 1918	25.85 square m

SEWERS.

Contracts for work completed during the year included 22,229 neal feet of 8, 12, 15, 18, 20, 21 and 22 inch cement or clay pipe ewers; 5246.15 lineal feet of 24, 27, 30, 33, 36, 39, 42, 54 and 60 inch inforced concrete pipe sewers and 3468.41 lineal feet of 72 inch onolithic concrete sewers.

The Sewer Department, in addition to the flushing and cleaning sewers, repairs to and setting to grade of manholes, built 44 manles and 795 catch basins during the year. In addition to the sewers id and accepted during the year 1918, amounting to 5.203 miles a cost of $110,842.00 there were laid 1517 lineal feet of 12 inch ipe, 142 lineal feet of 15 inch pipe and 544 lineal feet of 24 inch pe sewers by the Bureau of Sewers.

Up to the end of 1917, there were built 507.655 miles of sewer a cost of $7,453,831.03, making at the end of 1918, a total of 3.293 miles at a cost of $7,643,645.98.

The total length of sewers, including intercepting sewers, conructed by the city of Milwaukee up to the end of the year 1918, as 513.293 miles, as follows:

5.557 miles of 8 and 10 inch pipe
185.056 miles of 12 inch pipe
177.327 miles of 15 and 18 inch pipe
1.262 miles of 20, 21 and 22 inch pipe
1.500 miles of 24 inch reinforced concrete pipe
0.715 miles of 27 inch reinforced concrete pipe
1.759 miles of 30 inch reinforced concrete pipe
1.407 miles of 33, 36 and 39 inch reinforced concrete pipe
0.376 miles of 42, 45 and 48 inch reinforced concrete pipe
0.341 miles of 54 and 60 inch reinforced concrete pipe
14.083 miles of 24 inch brick
42.926 miles of 30 inch brick or monolithic concrete
19.217 miles of 36 inch brick or monolithic concrete
9.689 miles of 42 inch brick or monolithic concrete
8.994 miles of 48 inch brick or monolithic concrete
5.495 miles of 54 inch brick or monolithic concrete
6.503 miles of 60 inch brick or monolithic concrete
4.220 miles of 66 inch brick or monolithic concrete
6.458 miles of 72 inch brick or monolithic concrete
2.465 miles of 78 inch brick or monolithic concrete
2.754 miles of 84 inch brick or monolithic concrete
0.125 miles of 90 inch brick or monolithic concrete
3.397 miles of 96 inch brick or monolithic concrete
2.718 miles of 120 inch brick or monolithic concrete
9.295 miles of intercepting sewers (including intercepters built by Sewerage Commission)

The largest diameter of sewer built is 120 inch and the smalles diameter is 8 inch. There are 89 outlets for sewers into Milwaukee Menomonee and Kinnickinnic rivers and four outlets into Lake Mich igan. These sewers have 23,819 manholes and 25,088 catch basins there are also 77,787 house drains connected with the sewers an 441 storm drains. All work completed during the year, includin laying of sewers, water pipe, house drains and water services, ha been entered on the proper departmental records.

TRACK ELEVATION AND DEPRESSION.

Because of conditions arising as a result of the war, no wor was done in the city during the year on the plans for the elevatio and depression of steam railroad tracks. It is hoped, however, tha this work will be resumed at an early date. Orders of the Railroa Commission provide for a separation of grades on the Northern Div of the Chicago, Milwaukee & St. Paul Ry. from Highland Boulevar to Center Street; on the Madison Division of the Chicago & North western Ry. from 1st avenue to Forest Home Ave.; on the Nortl ern Div. of the Chicago, Milwaukee & St. Paul Ry. (Beer Line) a the North avenue crossing, necessitating the construction of a bridg from Humboldt Ave. to Newhall street.

LAKE STREET SEWER TUNNEL EXTENSION.

The Lake Street Sewer Tunnel Extension was completed Decen ber 3rd, 1918, having been started November 8th, 1917. It extenc from the tunnel previously completed at Green Bay Ave. along Lak Street west to 11 feet west of the center of West Nineteenth Stree

The tunnel consists of a 6 foot diameter storm sewer with a 1 inch sanitary sewer built in the lower south quarter of the tunne The total length of tunnel is 3445.2 lineal feet. There are 11 mar holes, one at each street intersection. Each manhole has two com partments, one for the storm sewer and the other for the sanitar sewer. The total lineal feet of manholes built is 428.

LINWOOD AVE. INTAKE TUNNEL EXTENSION.

On May 14th, 1918, the contractor resumed operations at the cit dock located at the foot of National Ave. A crib, known as th spider crib, was built which consisted of two courses of timber a sembled in the same plan as the submerged crib. The purpose of thi was to bring the steel crib, when placed above the surface of th water and also to maintain a good foundation. A crib with eigh courses of timber was built on top of the steel crib to protect th plant and men from heavy seas. The operating plant was then place upon the steel crib. When this was completed both cribs were towe to the vicinity of the submerged crib.

June 21st, 1918, the spider crib was placed on the submerged crib. Next the water in the steel crib was pumped out until the crib was bouyed up two feet above the bottom of the lake. This gave enough clearance to float the steel crib over the spider crib. On account of weather conditions the steel crib was not placed upon its foundation, the spider crib, until June 26th, 1918.

On July 11th, 1918, a steel diaphram was placed upon the sh[illegible] of timber segments which extended to the bottom of excavation in the center of the submerged crib and having an internal diameter of 18 feet. The bottom of excavation was 93 feet below the level of the lake. A shaft 6 feet in diameter made up of cast iron pipe sections was placed upon the steel diaphram and extended 5 feet above the level of the lake. A seal was thereby obtained to the bottom of excavation.

By July 30th, 1918, all water was pumped out of the shaft and the contractor started to excavate. Mining proceeded to a depth of 140 feet below the level of the lake or the "A" of the arch of the tunnel. On account of the water in the completed tunnel not being pumped out from the shore end the contractor suspended mining and concreted the excavated shaft to 16 feet from the top. The top of shaft is 2.5 feet above the bottom of the lake or elevation 64.5.

September 6th, 1918, mining was resumed at the bottom of the shaft and a box drift 6′ x 6′ was started West toward the completed tunnel. A hole was cut through the concrete bulkhead of the completed tunnel September 23rd, 1918, working from the lake shaft. The 6′ x 6′ drift was then widened out and concreted. The length of the tunnel to connect the lake shaft with the tunnel completed is 54.1 feet. Next the top of lake shaft was concreted and completed on Oct. 23rd, 1918.

All air locks, pumps, pipe lines, lights and wiring were removed from the tunnel and shafts. The tunnel was thoroughly cleaned. On October 30th, 1918, the water was turned into the tunnel from the lake shaft and on November 2nd, 1918, the tunnel was entirely filled. On November 2nd, 1918, the concrete cover was placed on the shore shaft.

The cast iron shaft and diaphram were removed from the steel crib, also some of the stone used for ballast. The steel crib was floated off the submerged crib on November 10th, 1918, and towed to a point two miles east of the gap in the U. S. Government breakwater. Here the crib was made lighter by removing all machinery and stone and on November 24th, 1918, was towed out in the lake in a northeast direction until the depth of water was 150 feet and here the crib was sunk.

The contractor closed down the plant on December 14th, 1918, on account of unfavorable conditions on the lake. The work left to complete the contract is the removal of the spider crib, surplus stone and timber segments inside of the submerged crib and placing the screen. The screen is built and already to be placed.

Chloride of lime was placed in the water at the lake and shor shafts. The water was pumped out of the tunnel into the lake at th North Point Pumping Station. When the water showed up satisfac tory to the City Chemist, it was turned into the water mains throug the pumps at the North Point Pumping Station. This was at 4:0 P. M. December 23rd, 1918.

REED STREET WATER PIPE TUNNEL.

No work has been done upon the proposed tunnel, under th Menomonee River, which is to contain the extension of the 20" wate main from Third and Fowler Streets to Reed and Point Streets Plans were made during the year but the construction was delaye in consequence of the Government's general order to limit new con struction, and the high cost of materials and labor.

Bids were received on December 12, 1918, as follows: Herma Hohensee, total $80,427; Prange, $119,810; O'Brien Construction Co $148,225.25.

The contract was awarded to Herman Hohensee, but up to th end of the year he had not been able to obtain the required bond i order to enter into the contract.

EXPERIMENTAL FILTER PLANT.

During the summer months a frame building 40 ft. by 70 ft. wa built at the North Point Pumping Station. In it have been placed a the apparatus necessary to determine the proper method of treatin Milwaukee water supply in the future. The building and tanks wer let on contract to C. A. Kleppe for the sum of $8,282.00. However the installation of the necessary heating, illumination, drains and ex perimental apparatus other than those included in the above con tract. the enlargement of the chemical and bacteriological laborator and the wages of employees during 1918 has raised cost of equippin the station to nearly $15,000. The building, tanks, equipment an other experimental apparatus were installed according to plans de signed by the consulting engineer engaged by the City to make th tests, Mr. Jos. W. Ellms of Cleveland, Ohio. The construction wa done under the supervision of the Engineering Division of the Wate Department.

The lake water will be treated chemically with either lime, iron sulphate or alum, mixed in various apparatus, settled in a 40 ft. b 20 ft. coagulation basin and then filtered through two rapid sand filte of 0.001 acre capacity each. The raw and the filtered water is also to b treated with ozone or liquid chlorine. The experiments will continu thruout the year 1919 and the data from the experiments will b used to determine the method of purifying the water supply of th City.

RIVER AND JONES ISLAND SURVEYS.

Beyond the completion of the office work in adjusting the survey data obtained during 1917, together with the drafting of preliminary maps of the River Survey and of the lower end of Jones Island (so-called), said work occupying the time of two computers for the first three months of the year, no work was done on the River or Jones Island Surveys. Most of the personnel of the survey party entered military service and the work was discontinued for the duration of the war.

During the year but two surveys were made to establish dock lines, one on the Milwaukee River, south of Ship Street, for the Milwaukee Western Fuel Co. (a piece of concrete dock about 40 feet long), and one on the Kinnickinnic River. The latter involved straightening the present line from the junction of the Milwaukee and Kinnickinnic Rivers, west side, to the Chicago & Northwestern Ry. bridge over the Kinnickinnic River along property owned by the Milwaukee Coke & Gas Co. and the U. S. Government. The said improvement in the Inner Harbor lines was passed by the Common Council ordinance in December. Extra work was done in re-subdividing some of the various parcels of land on the Jones Island Survey in order to settle conflicting claims to the said property, which is now being paid for through the City Attorney's Office.

With the settlement of the war in sight, and the return of several of the engineers, a new survey party has been organized to continue the work on the Jones Island Survey and the River Survey, which will begin the first of the coming year. It is hoped that the dock lines for all the rivers will be established in the field. by stone monuments, and the necessary maps completed during the coming year.

BREAKWATER GAP.

In order to render the waters of the lake at McKinley Park Bathing Beach more suitable to bathe in, by removing the stagnated water and the floating debris present on the surface at times, it was deemed necessary to cut a gap in the Government Breakwater north of said bathing beach. A gap 25 feet in length, with a resulting depth of water of about 3½ feet therein, was cut about 180 feet east of the shore south of the breakwater. A simple steel bridge consisting of "I" beams with heavy latteral bracings, a plank floor and iron railings with heavy concrete abutments, spanned the opening. The floor of the bridge was raised about 3 feet above the level of the top of the breakwater so that the formation of ice in the gap would not destroy the bridge. The contract price was $3,670.00 and the builder the Great Lakes Dredge & Dock Co. The only other bid received was from the Edw. E. Gillen Co. for $4,749.00. It is expected that adequate circulation currents will be induced back and forth through the opening in the breakwater to provide the clean water necessary to the proper enjoyment of the bathing facilities provided at this popular beach.

RUBBLE MOUND BREAKWATER.

The Rubble Mound Breakwater, which is still in the course of construction in the outer harbor, between the foot of Wisconsin street and the north harbor pier, has not been completed to date, due to various controversies between the city and the contractor in regard to the work as done. A survey of the total length of the breakwater was made during the month of June and a map was drawn showing the actual cross sections of the breakwater every fifty feet. The breakwater is 4,932 feet in length, including 2 gaps each 250 feet long. It is constructed in an average depth of water of 10.94 feet, has a 6 foot top with a side slope on the lake side of 2 to 1 and a side slope of 1½ to 1 on the land side. At present about 1,800 lineal feet of breakwater has been completed, leaving about 3,132 feet to finish. In November, after the contractor had placed 10,000 tons of stone and reclaimed some stone outside the lines, another survey was made of the southern portion of the breakwater. It is expected that the breakwater will be completed in 1919 with the addition of about 30,000 tons of stone.

TWENTY-SEVENTH STREET VIADUCT.

This department investigated the report of the Electric Company relative to the condition of the 27th street viaduct. The investigation disclosed no alarming overstressing of the floor members due to the running of the heavy interurban cars thereon, but it did disclose the fact that the concrete floor slab was rapidly breaking up under the effect of heavy steel car and roadway traffic. Several photographs were taken to illustrate the damage done to the viaduct. The reports of the Electric Company and of this office did not cover a complete investigation of the entire structure of the viaduct, and the question of the bridge's safety and proposed repairs to the bridge with a determination of the costs and their fair apportionment between the Electric Company and the city has been referred to the Railroad Commission of Wisconsin.

FINANCIAL.

BUREAU OF ENGINEERS—GENERAL OFFICE.

Budget appropriation	$ 5,037.00

EXPENDITURES.

Personal service (permanent)	$ 4 281.91
Office supplies	119.92
Minor repairs	4.10
Postage	33.00
General service	15.75
Official bond (City Engineer)	25.00
Office equipment	166.18
Total	$ 4,645.86
Unexpended balance	391.14
	$ 5,037.00

BUREAU OF ENGINEERS—ENGINEERING DIVISION.

Budget appropriation	$42,815.00
Service vouchers	485.81
	$43,300.81

EXPENDITURES.

Personal service (permanent)	$32,010.95
Personal service (temporary)	1,619.72
Office supplies	222.86
General supplies	959.87
Minor Apparatus	137.83
Tools	18.35
General materials	26.20
Minor repairs	87.64
Municipal Garage service	1,251.32
Postage	19.50
Storage of vehicles	225.00
Street car fare	100.00
General service	259.75
Office equipment	131.00
General equipment	38.25
TOTAL	$37,108.24
Unexpended balance	6,192.57
	$43,300.81

RECAPITULATION.

General office, budget		$5, 037.00
Engineering Division, budget and vouchers		43,300.81
		$48,337.81
General Office expenditures	$ 4,645.86	
Engineering Division expenditures	37,108.24	
Total expenditures	$41,754.10	
Bureau of Engineers, balance	6,583.71	
	$48,337.81	

Nineteen members of this department were enlisted in the Army and Navy during the year and work was handicapped to a considerable degree.

In conclusion I desire to express my sincerest appreciation to the employes of the department for services which they rendered during the past year.

Respectfully submitted,

GEO. F. STAAL,
City Engineer.

Annual Report

of

Bureau of Power Plants
Flushing Stations

For the Year

1918

THOMAS McMILLAN,
Chief Engineer of Power Plant

January 31, 1919.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

I herewith report the operations of the several Power Plants for the year ending December 31st, 1918.

MILWAUKEE REFUSE INCINERATOR.

Joseph E. Roddy, Superintendent.

Owing to the decrease in the amount of garbage and city refuse received, the steam generated at times was only sufficient to operate the Incinerator machinery, and but little surplus power was obtained to operate the Milwaukee River Flushing Plant. From July 16th to October 31st, power was purchased from the T. M. E. R. & L. Co., the surplus electric power from steam generated at the Incinerator Power Plant being returned to their lines and the value deducted from the power bills, as shown on records.

One boiler was equipped with an extended furnace in 1918; and another extended furnace will be provided in the early part of 1919, so that fuel may be fired direct to the boilers. This addition, with the improvements being carried out at the Milwaukee River Flushing Plant, should make it possible to furnish sufficient power to keep the Milwaukee River from becoming a public nuisance during the summer months of 1919, and reduce the cost of operation below that paid for purchase power.

TOTAL COST OF OPERATION
GARBAGE AND MIXED REFUSE INCINERATED.

Year	Total Tons mixed refuse incinerated	Total Cost including Equipment	Total Cost of equipment	Total Cost of operation only	Cost per ton
1911	50,803.39	$57,419.47	$5,056.45	$53,363.02	$1.05
1912	48,413.32	56,760.51	3 580 74	53,179.77	1.10
1913	53,581.02	66.147.30	4,269.31	61,877.99	1.15
1914	54,684.15	67,892.43	1,365.48	66,526.95	1.22
1915	58 043.10	66,812.56	3,695.49	63,117.16	1.09
1916	54,275.36	67,613.10	3,374.64	64.238.46	1.1835
1917	46.979.97	75,921.82	3,842.75	72,079.07	1.534
1918	45,457.58	81,797.80	750 20	81.047.60	1.7837

STATEMENT SHOWING TOTAL REFUSE INCINERATED, CITY AN
PRIVATE COLLECTIONS DURING 1918, AND FEED
WATER PUMPED TO BOILERS.

Month	Total hours operated	Total Pounds mixed refuse incinerated	Cu. ft. of water to boilers	Temp. of water to boilers	Average pounds of water per hour to boilers	Average evaporation per pound of mixed refuse
January	664	5,650,600	71,860	180	4,353,279	1.298
February	608	5,464,720	64,904	180	3,931,884	1,389
March	664	6,718,980	72,770	180	4,408,407	1.524
April	664	7,163,380	81,408	180	4,931,697	1.450
May	680	7,819,220	85,631	180	5,187,526	1.507
June	632	8,138,900	100,775	180	6,104,949	1.333
July	672	8,771,700	82,607	180	5,004,332	1.752
August	680	9,386,140	79,151	180	4,794,967	1.957
September	632	8,498,720	82,225	180	4,981,191	1.706
October	680	8,641,680	79,664	180	4,826,044	1.790
November	640	7,631,740	79,900	180	4,840,342	1.576
December	664	7,029,380	65,646	180	3,976,835	1.767
TOTALS	7,880	90,915,160	946,541	...	57,341,453	1.585

Average percentage of refuse incinerated during 1918: Garbage, 69.72 p
cent Ashes, 25.12 per cent Rubbish, 5.07 per cent Manure, 07 per cent.

INCINERATOR POWER PLANT—1918.

Thomas Coughlin, Engineer in Charge.

The Power Plant equipment is the same as in former years. The ver delivered in 1918 from the Incinerator Power Plant to operate Milwaukee River Flushing Station was as follows:

	Total hours operating flushing station	Average K. W. operating flushing station	Total K. W. H. delivered to flushing station	Total K. W. H. returned to T. M. E. R. & L. Co.
uary	.40	...	242.00	.....
ruary	.....	...	.....	.....
ch	.....	...	.....	.....
il	1.00	340	340.00	.....
y	148.15	330	48,922.50	.....
e	409.20	330	135,080.00	.....
v	207.15	330	68,393.00	.....
ust	Returned to T. M. E. R. & L. Co.			59,518.00
tember	Returned to T. M. E. R. & L. Co.			76,158.00
ober	Returned to T. M. E. R. & L. Co.			60,804.00
ember	208.40	320	66,773.00	.....
ember	.....	...	.....	.....
TOTALS	975.10	330	319,750.50	196,480.00

From July 16th to October 31st Power was purchased from the M. E. R. & L. Co. to operate the Milwaukee River Flushing Sta- n. The surplus power from the steam turbine, at the Incinerator ver Plant was returned to the lines of the T. M. E. R. & L. Co. as above table.

MILWAUKEE RIVER FLUSHING STATION—1918.

David E. Cameron, Engineer in Charge.

al hours in operation—flushing	3,345.35
l K. W. H. delivered	997,474
al K. W. H. delivered from T. M. E. R. & L. Co	749,056
al K. W. H. delivered from Incinerator Power Plant	248,418
al cubic ft. of water displaced	8,296,544,835
al gallons of water displaced	62,062,461,235
rage head of water in feet	2.717

Considerable repairs are necessary to place the Plant in good op- ing condition. The driving pinion requires renewal, and the e gear wheel recutting, to match the new pinion gear.

The winding of the motor was originally for 350 H.P. Th always run warm, being overloaded, this motor will be rewound f 450 H.P. and a new set of resistances furnished for the present fa plate starter. This work is now under way, so that the Plant equi ment may be placed in operation early in 1919. When this work completed the plant equipment should be in good operating cond tion.

KINNICKINNIC RIVER FLUSHING STATION—1918.

Ernest O. Eggebrecht, Engineer in Charge.

Total hours in operation	6,233.2
Total cubic feet of water displaced	9,525,862,000
Total gallons of water displaced	71,258,391,682
Average head of water in feet	2.2
Total coal consumed in pounds	2,273,500

Only minor repairs were necessary during the year on the m chinery and boilers, and all are now in good operating condition; a will be examined during the early part of 1919 and placed in goo condition where necessary, to prevent stagnation of the water of th Kinnickinnic River.

JONES ISLAND PLANT—1918.

Joseph P. Rafenstein, Engineer in Charge.

As the old horizontal centrifugal pump at this plant had not bee operated for some time, being out of alignment owing to the settlin of its foundation, it was suggested by the Chief Engineer of the Sew erage Commission to have the pump removed, as the space was ne essary for pumps and motors for further experiments.

Authority was obtained from the Common Council to dispose o the old pump and machinery connected therewith. The pump wa removed during July, 1918. The centrifugal pumps and motors fu nished by the Sewerage Commission for further experiments wer then placed in position by the employees of the Jones Island Plan who since that time have attended to the operation of the machiner and boilers for experimental purposes.

Respectfully submitted,

THOMAS M'MILLAN,
Chief Engineer of Power Plants.

ANNUAL FINANCIAL REPORT OF THE BUREAU OF POWER PLANTS FOR THE YEAR 1918.

	Incinerator Power Plant	Incinerator	Jones Island Plant	Kinnickinnic River Plant	Milwaukee River Plant	McKinley Park	Milwaukee River Dam	TOTALS
Personal Service (permanent)	$4,329.92	$70,803.03	$16,530.00	$14,291.10	$ 9,455.16	.....	.....	$115,409.21
Personal Service (temporary)	.....	.....	.....	.....	.....	$1,897.17	$ 39.94	1,937.11
Botanical Supplies	.....	.....	.....	.....	.....	87.70	.....	87.70
Cleaning and Dis. Supplies	.....	27.67	28.00	67.58	1.34	.....	.....	124.59
Fuel	.....	1,346.61	8,812.36	7,203.80	440.75	.....	.....	17,803.52
Medical and Laboratory Supplies	.....	.....	.....	5.67	.....	.....	.....	5.67
Office Supplies	.....	45.30	.....	.....	7.49	.....	.....	52.79
General Supplies	51.62	1,053.82	95.20	399.66	147.34	22.13	.....	1,769.77
Minor Apparatus	.....	26.05	18.87	11.05	.....	.....	.....	55.97
Tools	.....	15.77	3.00	12.05	2.15	.....	.....	32.97
General Materials	14.80	592.60	40.36	133.86	101.51	1,006.96	.....	1,890.09
Minor Repairs	876.81	3,577.94	.....	76.68	47.49	.....	.....	4,578.92
Municipal Garage Service	.....	141.42	.....	141.61	.....	.....	.....	283.03
Power	.....	.....	.....	.....	9,473.43	.....	.....	9,473.43
Team Hire	.....	482.91	.....	.....	.....	585.75	.....	1,068.66
Telephone	.....	9.35	72.00	93.60	49.44	.....	.....	224.39
Water	.....	2,707.66	179.51	158.07	.....	295.74	.....	3,340.98
General Service	.....	117.47	.....	33.19	8.98	.....	.....	159.64
Net Operating Expenses—1918	$5,273.15	$80,947.60	$25,779.30	$22,627.92	$19,735.08	$3,895.45	$ 39.94	$158,298.44
General Equipment	.....	750.20	.....	.....	.....	.....	.....	750.20
(Special) Curbing and Gutter Fund	.....	.....	.....	.....	.....	2,200.00	.....	2,200.00
Total Expenses—1918	$5,273.15	$81,697.80	$25,779.30	$22,627.92	$19,735.08	$6,095.45	$ 39.94	$161,248.64
Budget Appropriation	$4,940.00	$88,498.00	$33,136.00	$25,365.00	$26,200.00	$5,807.00	$265.00	$184,211.00
Miscl. Acc'ts. Receivable	.....	25.15	2,195.00	.....	.....	.....	.....	2,220.15
Total Receipts and Appropriations	$4,940.00	$88,523.15	$35,331.00	$25,365.00	$26,200.00	$5,807.00	$265.00	$186,432.15
Board of Estimate Transfer	(1)750.00	(2)2,600.00			(3)150.00	(4)800.00		
Total Appropriation, Receipts and Transfers	$5,690.00	$91,123.15	$35,331.00	$25,365.00	$26,350.00	$6,607.00	$265.00	

(1) Transferred from Milwaukee River Plant.
(2) Transferred from Jones Island Plant.
(3) Transferred from Jones Island Plant.
(4) Transferred from Incinerator.

Report of
Bureau of Illumination Service
For the Year
1918

REPORT OF BUREAU OF ILLUMINATION SERVICE.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

We are handing you herewith report of the Bureau of Illumination Service for the year ending December 31st, 1918.

The two installation contractors who started in April were able to install the following materials:

Concrete posts	1,571
Cable	467,846 feet
Pipe in ground	35,000 feet

There were 1,808 city light units in operation on December 31st.

The Bureau has completed and put in operation the following sub-stations:

Sub	Location
H	Engine House Cerner 3rd and Auer avenue.
N	Engine House corner Park Place and Bartlett avenue.

We have also built the following stations that are ready to receive the control apparatus:

Sub	Location
G	Engine House corner 27th and Center streets.
D	Engine House Walnut street between 24th and West 24th streets.
O	Engine House corner 21st avenue and Scott street.
A	Engine House 2nd street between Sycamore and Clybourn streets.
B	Auditorium—corner 6th and Cedar streets.
L	City Hall—East Water street.
K	3rd Ward Natatorium, corner Jackson and Cameron streets.

The apparatus for all stations is on hand and they will all be in operation in the year 1919.

We feel that considering the delays due to shortage of building materials due to the emergency conditions, our construction program was cut considerable, but we feel that by the issuing of the bonds asked for, we can award a contract covering about forty circuits and amounting to about $200,000.00 in 1919 to overcome this delay.

During the year, we have reported to the Electric Company 6,230 lamp outs for which we have deducted $1,121.40 from their bills.

There were 10,689 gas lamps out and 2,928 gasoline lamps out for which we have deducted from the Welsbach Street Lighting Company of Wisconsin $1,015.10.

The following old street lamps were replaced by the new e units:

Kind	Quan
Arc lamps—electric	
Gas lamps	
Gasoline lamps	

Now that the construction and operation of the Safety Isle is this Department, we feel that although the first cost of the so-call "Silent Cop" is small, the operation is such as to warrant the use the permanent electric isle in all places. Therefore, we recomme only the electric ones.

The following is the number of each in service:

Electric safety isles	
Silent Cops	

We wish also to call your attention to the fact that while our 19 operating cost was higher than that of 1917—this was entirely d to the increase for electric energy and salaries.

The following is the financial statement of the Bureau:

BUREAU OF ILLUMINATION SERVICE.

Division of Maintenance and Operation.

STATEMENT OF EXPENSE, RESERVES AND ABATEMENTS.
Year Ending December 31st, 1918.

ACTIVITY	Expenditures	1919 Reserves	Total Charges	1918 Reserves	Abatements	Total Credits	Net Expense
General Office	$ 8,635.23	.....	$ 8,635.23	.....	.....	.....	$ 8,635.23
Laboratory	2,099.61	$1,095.22	3,194.83	.....	.....	.....	3,194.83
Storehouse	2,356.28	.....	2,356.28	.....	.....	.....	2,356.28
STREET LIGHTGING—							
Operation	251,834.99	1,568.00	253,402.99	$ 7,167.04	$154.31	$ 7,321.35	246,081.64
Maintenance	25,858.91	1,968.20	27,827.11	.....	313.74	313.74	27,513.37
Construction	8,268.62	4,389.63	12,658.25	7,950.75	.....	7,950.75	4,707.50
Miscellaneous—Special Funds	2,271.36	4.00	2,275.36	.....	528.58	528.58	1,746.78
TOTALS	$301,325.00	$9,025.05	$310,350.05	$15,117.79	$996.63	$16.114.42	$294,235.63

BUREAU OF ILLUMINATION SERVICE—CONSTRUCTION DIVISION.

STATEMENT OF REVENUES, EXPENDITURES AND RESERVES
Year Ending December 31st, 1918.

REVENUES.

1917 Balances—		
Reserves for Contracts	$268,285.94	
Unencumbered Balance	291,296.26	
Purchase Orders	4,695.70	
Resolution	2,300.00	
		$566,577.
Proceeds from Sale of Bonds		200,000.
Miscellaneous—Accounts Receivable and Service Transfer Vouchers		3,470.
TOTAL REVENUES		$770,048.

EXPENDITURES AND RESERVES.

Expenditures—		
Open Market Orders and Salaries	$ 57,199.37	
Payments on Contracts	241,066.40	
Resolution—Salary of Engineer	900.00	
TOTAL EXPENDITURES		$299,165.
Jan. 1 Reserves for Contracts	$268,285.94	
New Contracts and Adjustments	240,869.33	
	$509,155.27	
Less Payments made thereon	241,066.40	
Reserves—for Contracts, Dec. 31st, 1918	$268,088.87	
For Purchase Orders	10,819.69	
For Resolution	1,400.00	
TOTAL RESERVES		$280,308.5
UNEMCUMBERED BALANCE, December 31st, 1918		190,574.4
Total Expenditures, Reserves and Balance		$770,048.7

(Signed) H. F. ILGNER,
Illuminating Engineer

WM. W. RUMSEY,
Engineer Const. and Mtnce.

Report of
Water Works
For the Year Ending
Dec. 31, 1918

MILWAUKEE WATER WORKS

*Deputy Commissioner of Public Works
PERCY BRAMAN

Superintendent of Water Works
HENRY P. BOHMANN

City Engineer
GEO. F. STAAL

Thos. McMillan.....Chief Engineer of Power Plants.
Ferdinand Krieger.....Assistant Chief Engineer of Power Plants.
William Kunz.....Engineer in Charge of North Point Pumping Station.
William Borman.....Engineer in Charge of High Service Pumping Station.
John Koch.....Superintendent of Distribution.
Ferd. E. Fitz.....Assistant Superintendent of Distribution.
Frank J. Murphy.....Superintendent of Meters.
Oswald J. Runge.....Chief of Collection Division.
Arthur J. Conaty.....Chief Accountant (General Office).
George J. Roderer.....Keeper of Pipe Yard.
Robt. L. Piper.....Water Chemist.

Committee on Water Works
ALD. JOHN W. RADKE, Chairman
ALD. JOHN DOERFLER, JR.
ALD. JOS. P. CARNEY
ALD. ROBERT J. LANDOWSKI
ALD. HERMAN O. KENT

*On Sept. 30, 1917, Mr. Fred G. Simmons resigned as Commissioner of Public Works. No successor being appointed, the Deputy Commissioner under the City Charter assumes the duty of the Commissioner of Public Works.

REPORT OF SUPERINTENDENT
OFFICE OF SUPERINTENDENT OF WATER WORKS
CITY HALL

Milwaukee, January 25th, 1919.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

I respectfully submit herewith the annual report of the Wate Works for the year ending December 31st, 1918.

The following is a condensed statement of the revenues and ex penditures of the department for the year 1918:

FINANCES.

Operating revenues (water only)		$1,101,277.3
Operating expenditures	$437,272.34	
Depreciation	108,971.10	546,243.4
		$ 555,033.9
Quasi operating revenues	$ 57,989.19	
Quasi operating expenditures	38,257.42	19,731.7
Financial revenue		100.0
Gross income from operation		$ 574,865.7
Deductions from above—Interest on bonded debt		10,125.0
Net income from operation		$ 564,740.7
Revenue—Water Mains Assessment		15,445.7
Net income from all sources		$ 580,186.4

DISPOSITION OF NET INCOME.

Transfer to Gen. City Fund	$200,000.00	
Transfer to unreserved proprietary interest	380,186.46	
		$ 580,186.4

Total amount expended for new construction work and outlays during the year was $441,247.43.

Total proprietary interest—Dec. 31, 1918	$9,953,838.9
Cost of Water Works less depreciation	9,233,316.0
Bonded indebtedness less sinking fund on hand	210,000.0

FINANCIAL.

The revenues of the department for water only for the year 1918 were $1,101,277.39, being an increase of $69,346.12 over the previous year.

The total revenues of the department from all sources were $1,174,812.32.

The net income of the department over and above operation, maintenance, depreciation and interest on bonded indebtedness were $580,186.46. Of this sum $200,000.00 was transferred to the General City Fund towards reducing the general tax, and the remainder used for new construction and equipment.

No bonds were issued during the past year. All new construction work was paid for out of surplus earnings and depreciation reserve cash of the Water Department, which under the public utility law may be used for new constructions, extensions or additions to property, or invested.

The surplus earnings of the Water Works transferred to the General City Fund since 1892 now aggregate the sum of $2,917,965.00 which sum exceeds the sums raised by tax levy before the department was self-sustaining by $1,040,426.28.

The book value of the Water Works less depreciation written off is $9,233,316.09 with a bonded indebtedness, less sinking fund on hand of $210,000.00.

STATEMENT SHOWING ESTIMATED COST OF SUPPLYING WATER AND REVENUE RECEIVED FOR SUPPLYING WATER TO CONSUMERS DURING THE YEAR 1918.

COST.

Cost of operation	$437,272.34	
Interest on bonded debt	10,125.00	
Total ordinary expenditures		$ 447,397.34
Sinking fund for bonded indebtedness	15,000.00	
Depreciation of Water Works Property and Equipment	108,971.10	
Taxes on true value of Water Works Property	136,453.57	
Interest on net invested capital at 4 per cent	369,332.64	
		631,757.31
Total estimated cost of supplying water during 1918		$1,079,154.65

*The items of taxes and interest are not actually charged on the books of the department. The department has used these monies for new construction work and outlays and in this manner has been able to pay for all new construction work and outlays from 1896 to 1913 without the necessity of issuing bonds. A bond issue of $300,000.00 was found necessary in 1913 for the construction of Section No. 1 of the Linwood Avenue Intake Tunnel, the contract for which amounted to $450,000.00. No bonds have been issued since 1913.

REVENUE.

Total revenue for water only	$1,101,277.39
Revenue per 1000 gallons based on total pumpage	.04819

Cost of supplying water per 1000 gallons.

	Gallons
Total pumpage for year 1918	22,848,616,040
Cost per 1000 gallons based on total pumpage and total ordinary expenditures	$ .01958
Cost per 1000 gallons based on total pumpage and total ordinary expenditures, plus sinking fund, charges, depreciation, taxes, and 4 per cent interest on net invested capital	.04723

OPERATION AND MAINTENANCE.

The cost of operation and maintenance for the year 1918, excluding depreciation was $437,272.34, or an increase of $52,775.13 over the preceding year. Greater pumpage and the increased cost of labor and materials in consequence of the war, are the causes of the increase. The increased cost of operation, however, is more than offset by an increase of $69,346.12 in operating revenues. The revenue of $48.19 per million gallons pumped for the year 1918 is an increase of 69 cents per million gallons over the preceding year.

WATER RATES.

Since May 1, 1913, all services are metered, with the exception of such supplying Automatic Fire Sprinkling Systems, Fire Hydrants, Fire Cisterns, Horse Drinking Troughs and Bubblers.

The metered rate which remains unchanged, is 4½ cents per 100 cubic feet or 6 cents per 1,000 gallons for water supplied within the city; and 6 cents per 100 cubic feet or 8 cents per 1,000 gallons for water supplied for consumption beyond the city limits. There is no "minimum charge," nor "service charge," the consumer paying only for actual consumption. The meter must be furnished and kept in repair by the consumer.

The charge for hydrant rental is $5.00 per hydrant per year; Drinking Troughs and Bubblers, each $50.00 per year.

Water is furnished outside of the city to the Villages of Shorewood, West Milwaukee, North Milwaukee, Whitefish Bay, the City of West Allis, County Institutions in the Town of Wauwatosa, and to a number of individual consumers in the towns of Lake, Milwaukee, Greenfield and Wauwatosa.

WATER SUPPLY.

Milwaukee receives its entire water supply from Lake Michigan. The first intake consisted of a cast iron pipe 36 inches in diameter which extended 2100 feet out into Lake Michigan into 18 feet depth of water. The second intake, known as the North Point Intake, consists of a brick tunnel 7½ feet in diameter and 3146 feet in length, and extends from a short shaft to a lake crib. From said lake crib two parallel lines of 60-inch cast iron pipe, laid in a trench

8 feet in depth extended 5000 feet farther out into the lake into 60 feet depth of water; the outer ends of the upturned pipes being held in place by submerged crips. The compartments into which the pipe opens are covered with wooden grating 2-inch x 12-inch planks, set on edge and spaced 2 inches apart. The total length of this intake is 8146 feet or a little over 1½ miles. The distance of the intake from the mouth of the harbor is about 3½ miles. The maximum capacity of this intake is 95,000,000 gallons in 24 hours. Work on this intake was begun on July 30, 1890 and was completed and put in service on September 25, 1895. Upon its completion the 36-inch intake was permanently put out of service. The North Point Intake supplied the city with water until December 23, 1918, when the supply was shut off and water was drawn from the new Linwood Avenue Intake.

The third intake which is known as the Linwood Avenue Intake consists of a concrete lined tunnel 12 feet internal diameter and 6554 feet in length. At the terminus of the tunnel in 65 feet depth of water there was placed an octagon submerged intake crib 86 feet, 7 inches long diameter, 80 feet short diameter and 12 feet in height. The opening for the lake shaft is 12 feet in diameter. Work on this intake was begun on June 1, 1913. The first section, consisting of 4000 lineal feet of 12 foot tunnel was constructed by Jos. Hanreddy & Co., contractor of Chicago, Illinois, under contract dated April 29, 1913. Section No. 2, consisting of 2554 lineal feet of tunnel and submerged intake crib was built by the O'Brien & Jackson Construction Co., contractors of Chicago, Illinois, under contract awarded to them on March 8, 1916, and work was begun on July 21, 1916.

On account of unfavorable weather conditions out in the lake, it was impossible to place the screen over the submerged crib and remove the surplus stone and timber segments inside of the submerged crib. This will be done next spring or as soon as the weather permits. This, however, did not interfere with placing the new intake in service, which was done on December 23, 1918 at 4:00 P. M. Before this tunnel was placed in service it was thoroughly disinfected with a solution of Hypochlorite of Lime, 1200 pounds placed in the shaft out in the lake and 500 pounds in the shore shaft before the tunnel was allowed to fill up. After the tunnel was filled, Worthington duplex pump pumped from November 16th to December 23, 1918, the water pumped being wasted in the lake.

This tunnel is 1½ miles north of the North Point Intake which brings it five miles distant from the mouth of the harbor. The capacity of this intake is approximately 220,000,000 gallons in twenty-four hours at a velocity of three feet per second.

The amount expended to date for the Linwood Avenue Intake, including the 9-foot shore tunnel which connects this intake tunnel with the North Point Pumping Station, located a little over a mile south, is $1,605,862.81.

WATER CONSUMPTION—1918.

1	Municipal Use (Gallons) 2	Industrial Use Power and Mfg. (Gallons) 3	Commercial Use Dwellings and Stores (Gallons) 4	Total Gallons 5	Per Cent 6
Total metered consumption	1,094,734,900	8,343,185,300	6,818,467,100	16,256,387,300	74.89
Estimated flat rate consumption	1,225,067,312	35,658,000	5,492,000	1,266,217,312	5.83
Unmetered free use (See details Supt. of Meters report)	.....	.....	.....	192,745,100	.89
Under-registration of meters (Estimated at 3% of Water passed through meters	.....	.....	.....	502,774,865	2.32
"Unaccounted for"	.....	.....	.....	3,488,060,661	16.07
TOTALS	2,319,802,212	8,378,843,300	6,823,959,100	21,706,185,238	100.00

(Total pumpage based on plunger displacement of pumps, 22,848,616,040 gallons, less 5½ Estimated slippage of pumps equals 21,706,185,238 gallons delivered into distribution mains.)

Estimated population supplied, including suburbs, 485,000.

	Per Capita .Gallons	Net Pumpage Percentage of
Municipal use	13.11	10.69
Industrial use	47.33	38.60
Commercial use	38.55	31.44
Under-registration of meters	2.83	2.31
Departmental free use	1.09	.89
"Unaccounted for"	19.71	16.07
TOTALS	122.62	100.00

Gallons per capita for net pumpage	21,706,185,238 =	122.62
Gallons per capita for slippage of pumps	1,142,430,802 =	6.45
Gross Pumpage (Plunger Displacement)	22,848,616,040 =	129.07

WATER PURIFICATION.

The application of liquid cholrine for the purpose of purifying ur water supply was continuous during the year. A Wallace & Tiernan manual control solution feed, type B chlorine control apaaratus was installed and placed in service on February 9, 1918. his apparatus is of ample capacity to treat our entire pumpage uring maximum consumption. Two of the three Electro-Bleaching as Company's chlorine apparatus, installed March 31, 1915, will e kept in operating condition for emergency use, only. The third achine is in very poor condition, and as this type of apparatus s no longer built, and repair parts too costly, it will be used to pply repair parts to the other two apparatus.

Daily bacterial analyses made of the untreated and treated water ow the following results for the past year.

The average number of bacteria in 1 c. c. of untreated water, deeloping on gelatine plates, incubated 48 hours at 20° C. was 5105 nd on agar, incubated 48 hours at 37° C., 179.

The average number of bacteria in 1 c. c. of treated water deeloping on gelatine plates incubated 48 hours at 20° C. was 159, nd on agar, incubated 48 hours at 37° C. 18.

"Gas Formers" were present in the untreated water in 99.3 per nt of all 10. c. c. samples; 73.5 per cent of all 1 .c. c. samples and 4.6 per cent of all .1 c. c. samples examined. In the treated water, gas formers" were present in 41.5 per cent of all 10. c. c. samples; 0.7 per cent of all 1 c. c. samples and 1.7 per cent of all .1 c. c. samples examined.

The amount of chlorine applied varied from 30 to 42 ounces per illion gallons of water, or from 0.22 to 0.31 parts available chlore per million parts of water. An average removal of 96.45 pernt of all bacteria, based on gelatin count was effected by the lorine treatment.

The average death rate per 100,000 of population for the year 18 was 6, there being 103 cases and 28 deaths reported by the ealth Department.

In previous reports, mention was made of the fact that tastes d odors appeared at times in our water supply, particularly durg the winter months, and that these tastes and odors appeared incident with the use of chlorine for purifying our water supply. ese tastes and odors which the average person described as of a nedicinal character" and very much resembling carbolic acid or loform, became so frequent and so intense with each recurrence ring the past year that the water supply was totally unfit for nsumption during such periods. The taste remained in the water n after boiling, in fact, the taste seemed more pronounced after

the water was boiled. At first these odors and tastes were attril uted to the use of chlorine in disinfecting our water supply an whenever taste appeared the quantity of chlorine was reduced, a though it was soon discovered that the obnoxious taste frequent appeared when lesser quantities of chlorine were used and was al sent when larger quantities were being applied. It was also di covered that the appearance of these objectionable tastes and odo in the city water were always accompanied by south or southwe winds, which blow the contaminated water from the harbor outle where the three rivers which flow through the city, unite and di charge their sewage-laden contents into the lake, and thence to th intake, which is only 3½ miles from the harbor outlet in a nort easterly direction.

As the chlorine treatment is in charge of a competent chemi and is applied under the most careful supervision, and tastes ar odors appeared only when the wind was from a certain directi we were convinced that the tastes and odors were not due to t use of chlorine alone, but that the action of the chlorine on some the organic matter present in the polluted lake water formed co pounds that produced taste and odor. That chlorine in the qua tities used (.22 to .34 P.P.M.) to disinfect our water supply w not a factor in itself in producing tastes and odors, was also a parent from the fact that taste was present on days when there w less free chlorine in the tap water in various parts of the city than days when the quantity of free chlorine was 50 per cent greater, a taste and odor absent, although the quantity of chlorine applied w the same on both dates.

In discussing the matter of tastes in water supplies with member of the American Water Works Association, while atten attending the A. W. W. association convention at Richmond, Va., t writer learned that he had experienced trouble similar to ours and th he attributed it to the industrial waste from a coke plant getti into their water supply. With this information as a key to a p sible solution of our troubles, samples were taken of the effluer being discharged at the local coke and gas plants. In the Wat Works laboratory chlorine was added to a sample of tastel raw water until the ortho-toliden test showed .09 P. P. M. free chlorine in the sample, this amount of free chlorine rep senting the maximum that the tap water has ever contained. T addition of chlorine did not produce any taste to the sample. Aft the addition of some of the effluent from the coke plant to t chlorinated sample, the sample had a decided taste, resembling th of coal-tar derivatives and was almost identical with the charact istic taste at times present in our water supply. The sample was th boiled and cooled to its former temperature. After boiling a cooling, the ortho-tolidin test showed no free chlorine present, wh the taste was there to a greater degree than before boiling.

The result of the initial test of the first three samples pointed o coal-tar derivative wastes in combination with the chlorine added o our water supply. These substitutions or additive compounds are robably the direct cause of the taste in the water. Such compounds oil at a higher temperature than water and therefore would not e expelled in boiling. When this fact was established, all further nvestigations of the cause of the taste in the city water were car- ied on jointly by Robt. L. Piper, Chemist of the Water Works, nd Russell W. Cunliffe, City Chemist, to whose pains-taking work n carrying out these investigations, the successful solution of our roblem can, in a large measure, be attributed.

In order to prove that only coal-tar derivative waste products rom industrial plants, in combination with the chlorine used to urify our water supply were the cause of the obnoxious taste and dor at times present in our water supply, nearly 900 samples of ewage and trade wastes of every description were secured and ested for taste in the manner above described, since it is impossible o prove the presence of these substances, when greatly diluted in he lake, by any chemical determination. It was only from samples f effulents of coal-tar derivative nature that the characteristic and bnoxious taste could be reproduced in the laboratory. All other amples failed to produce this taste. Tests made show that suf- ient chlorine can be added to a sample of tasteless raw water to roduce a distinctive clorine taste which, however, is quite dif- erent from the taste complained of. It was also found that the hlorine taste could always be removed by boiling or neutralized by odium thiosulphate. The objectionable taste complained of in the ity water, however, could not be removed by either of these two ethods. Tests were also made on solutions of tasteless raw water ith various substances, such as naphthalene, benzol, phenol petro- eum, oil, etc. It was found that only such solutions which con- ained substances of coal-tar derivation produced the taste com- lained of upon chlorination.

From a series of laboratory tests made so far we find that it kes from .22 to .3 P.P.M. of free chlorine before the chlorine taste ecomes noticeable in the sample tested for taste. Since the amount f free chlorine in our tap water has at no time exceeded .09 P.P.M. nd averages about .05 P.P.M., and the amount of chlorine applied only from .22 to .31 P.P.M., we feel certain that the objection- ble taste noticed from time to time is not due to free chlorine but o a combination of chlorine and certain coal-tar derivative waste roducts.

A survey made of all industrial plants whose industrial wastes ntained objectionable elements of coal-tar derivations, indicated at in addition to the local coke and gas plants, there were five ants located outside of the city whose effluent might possibly con- ibute to our water pollution. Of the five plants located outside

of the city, three were located at Carrollsville, which is about eigh miles south of our southern city limits, and about 13 miles distar from our water intake. The three plants located at Carrollsvill were under suspicion from the start as contributors to our troubl although it was impossible for a long time to establish this fac owing to the difficulty of securing samples out in the lake whe wind conditions were favorable. However, at a later trip, the fa was established beyond doubt as samples were secured at variou points in the lake between the Water Works Intake and Carroll ville, which upon clorination produced the objectionable taste i varying degrees.

One of the three plants at Carrollsville was engaged in the pr duction of phenol for the United States Government, partly in its ow plant and partly in a building owned by the Government. The combin production of phenol in the two plants, which originally amounte to only a few tons a day, had greatly increased until the quantit produced during the month of October, 1918 amounted to 130 to daily. It was estimated by the management that the daily trac waste flowing into the lake contained anywhere from 1100 to 22(pounds of phenol and the management was inclined to believe th the latter figure was more nearly correct. The possibilities of pr ducing taste in a water supply can best be appreciated when v learn that taste can be produced, after chlorination, in solutio containing one part of phenol to 500,000,000 parts of water. Th amount of phenol could pollute from 60 to 120 billions gallons water to such an extent that taste could be produced upon chlo nation.

When the obnoxious taste again appeared in a very acute for early in November, an appeal was made to the State Board of Heal to assist the local officials in obtaining immediate measures of relie Telegrams were sent by Mayor D. W. Hoan and Health Commi sioner Geo. C. Ruhland to Rupert Blue, Surgeon General, Unit States Public Health Service, and Newton Baker, Secretary of Wa asking them to lend their assistance as it was asserted that some the companies were engaged in Government work. A meeting w held in the Mayor's office which was attended by Governor Phill City and State officials and representatives of the coke and gas co panies. After a general discussion of the subject Governor Phill suggested that the Mayor appoint a committee to study the repo made by the chemists, visit all of the plants under suspicion and, possible, place the responsibility for the obnoxious taste in our wat supply. The Mayor then made the following appointments:

Dr. C. A. Harper, State Health Officer, and Prof. J. C. D. Mac State Chief Engineer, representing the State.

Dr. Geo. C. Ruhland, Health Commissioner; H. P. Bohmann, S perintendent of Water Works, and Wm. R. Copeland, Chief Chem of the Sewerage Commission, representing the City of Milwaukee.

R. B. Brown, General Manager and Chief Engineer of the Milwaukee Gas Light Co.

J. W. Schaffer, Vice-President, in charge of operation of the Milwaukee Coke & Gas Company, the Newport Hydro-Carbon Company nd the Newport Chemical Works, Inc., representing the industrial lants.

The committee visited the different plants and testimony was aken at each plant by Dr. C. A. Harper, State Health Officer. Later meeting of the committee was held at Madison, at which the ommittee framed its formal report. The conclusions of the committee were:

"That from its personal investigation and from a careful study f the reports that have been worked out by the chemists of the Water Department and Health Department and industrial companies, that the obnoxious odor and taste complained of in the Milwaukee water supply are essentially attributable to the effluent coming from the Newport Hydro-Carbon Company, a plant engaged in he manufacture of carbolic acid. It finds its belief substantiated in he fact that from Tuesday, November 26th, to Friday, November 29th, during southerly winds, when operations of the plant were uspended, there was no recurrence of the nuisance in the city's drinking water."

On December 16th, the plant of the Newport Hydro-Carbon Company was permanently closed and no more phenol will be produced t this plant. This will undoubtedly remove the largest factor in our water trouble.

The next largest contributer was the coke company, where it vas estimated that about 91 pounds of phenol was discharged daily vith its industrial waste. It was estimated that the amount of trade vaste having taste producing properties leaving the coke plant laily was sufficient to impart taste of the kind complained of in our vater supply to 10 to 40 billion gallons of water. The other plants contribute to this pollution according to the volume of the effluents being discharged from their respective plants, all of them, however, o a far less degree. The taste producing properties of the effluents f the plants investigated were found to range from dilutions of 1 to 00 to 1 to 400,000.

Basing opinion on the results of the many tests made it is reasonable to assume that any water supply which is being chlorinated nd which occasionally has a medicinal or phenol-like taste which annot be removed by boiling, may have been contaminated with vaste material produced in the destructive distillation of coal and n the recovery and manufacture of the by-products of this process otherwise it should be possible to remove the taste by boiling. The nly practical method known at the present time to avoid taste of

this nature is to keep this particular kind of effluent out of a wate supply. No water supply which is polluted with coal-tar derivative and where chlorine is used as a sterilizing agent can be made pala table for drinking purposes. It is possible by laboratory experi ments, some chemical may be found which will overcome the affinit of chlorine for the coal-tar bodies or change their composition s that they will not unite with chlorine. Every effort is being mad by the coke and gas companies to find a method of taking care o their industrial wastes.

As a result of a survey made by Sanitary Engineer H. P. Letton of the United States Public Health Service, in January, 1917, th Treasury Department, Bureau of Public Health Service, recommend ed that the City of Milwaukee take immediate steps toward the in stallation of an adequate filtration plant, which will furnish the Cit of Milwaukee with a palatable and safe water supply. The state ment having been made that it would be impossible to properly filte the Milwaukee water supply by the rapid sand process, because o the difficulty of getting a sufficient floc to form in the clear wate it was suggested and recommended that an experimental filter b constructed and that an engineer be engaged to study the problem With this in mind, the Common Council, on March 25, 1918, passe a resolution authorizing the Commissioner of Public Works to em ploy a Consulting Engineer, having expert knowledge of, and large practical experience in water filtration and purification plants to prepare plans and specifications for the construction of an exper mental water filtration plant and to conduct experimental work i water filtration and other methods of water purification for a perio of one year, and appropriated the sum of $30,000 to carry out th provisions of this resolution. The Commissioner of Public Work thereupon appointed Mr. Jos. W. Ellms, Consulting Engineer o Cleveland, O., to fill the position. Plans and specifications were pr pared by Mr. Ellms for a suitable building to carry on this work The building has been completed, and it is expected that shortl after the new year, operations at the experimental plant will be i progress.

PUMPING DIVISION.

The total amount of water pumped from the lake at North Poin Pumping Station during the year 1918 was 22,848,616,040 gallon computed from the actual plunger displacement of the pumps wit no allowance for slippage. This is an average daily consumptio of 62,598,948 gallons, and an average daily increase of 3,080,571 ga lons over the preceding year.

The maximum pumpage for any one day was on Juy 22nd, viz 84,748,400 gallons, and the minimum pumpage on December 25t 42,681,390 gallons. The maximum rate of consumption of "peak on the day of the highest pumpage was 125,000,000 gallons in 2

hours. As the daily rated capacity of this station is only 118,000,000 gallons, which includes the old vertical compound pumping engine in service since 1882, and which is unfit for regular service, it was found necessary to speed up the balance of the pumps and to lower the water in the reservoir in order to meet the demand. As our reservoir is not a storage reservoir, but an "equalizing" reservoir, which equalizes the pressure in the low service district, it is not possible to lower the water in the reservoir to any extent because it would affect the pressure in the entire low service district. The average daily consumption for the year 1918 was 62½ million gallons in round figures. Experience has proven that the maximum rate of consumption or "peak" is approximately double that of the average daily consumption for the year. As the maximum rate of consumption for the year 1918 was 125 million gallons, it can be seen that doubling the average daily consumption for the year is a reliable factor to ascertain the "peak" or maximum rate of consumption. Assuming only a normal increase in our consumption, the necessity for additional pumping equipment is very apparent. For these reasons, request has been made in the 1919 budget for an appropriation of $250,000.00 for the purchase of a 20,000,000 gallons low service triple expansion pumping engine to replace the old 12,000,000 gallon vertical compound pumping engine known as No. 3.

The average daily consumption for the past five years has been as follows:

Year	*Gallons*
1914	48,509,573
1915	47,444,314
1916	54,885,366
1917	59,518,377
1918	62,598,948

The amount of water repumped at the High Service Pumping Station was 1,641,413,100 gallons. In addition thereto four high service pumping engines, located at the North Point Pumping Station delivered 9,091,519,250 gallons direct into the high level district. The amount of water delivered in the high level district was 46.9 per cent of the total pumpage.

The total amount of water furnished to consumers outside of the city was 2,974,066,600 gallons, or 13.01 per cent of the total pumpage.

The revenue received for water furnished outside the city was $238,732.11 or 21.67 per cent of the total revenue received for water.

The average head pumped against in the low service was 164.6 feet; high service 282.3 feet. Average head of high and low service 211.454 feet which is an increase of 2.487 feet over the preceding year.

The average daily consumption of 129 gallons is again an increase over the previous year and seems extremely high, considering that we are practically 100 per cent metered. However, our high per capita is due to the large number of large industrial consumers and not due to preventable leakages, wastages or unknown losses.

The average duty of all engines at North Point Station was 106,293,985 foot pounds per 100 pounds of coal, and for the High Service Station, 79,539,603 foot pounds, being a decrease of 2,138,788 and 2,275,548 foot pounds, respectively, compared with the year 1917.

There has been a gradual falling off in the station duty, particularly at the main pumping station during the past five years, due to the inferior quality of coal received. When the percentage of ash increases over fifty per cent, we cannot look for high station duty. It is to be hoped that before long, coal can again be bought on the "B. T. U." basis which is the only guarantee of getting a good quality of coal.

The two 300 H. P. Water Tube boilers, installed by the Downey Heating & Supply Co., under contract dated April 4, 1917, for the sum of $23,677, were placed in service on June 14, 1918. The two 15 K. W. Generators, used for furnishing the necessary light for the North Point Pumping Station, and power for operating crane were replaced by two 25 K. W. Units built by the Northern Electrical Mfg. Co., and purchased from the Sewerage Commission for the sum of $1,400. Owing to the growth of the station, the smaller units were no longer of sufficient capacity to give satisfactory service.

On July 3rd, 1918, the new 12,000,000 gallon Triple Expansion pumping engine (designated as new No. 2) built by the Allis-Chalmers Mfg. Co. under contract dated June 11, 1917 for the sum of $175,000.00 was placed in regular service. The official test for capacity and duty was made on October 16, 1918, lasting twelve hours. Under the specifications, the required duty was to be not less than 180,000,000 pounds of water ralsed one foot high for every 1000 pounds of steam used, and to deliver not less than 12,000,000 gallons of water in 24 hours against a head of 275 feet with a piston speed not to exceed 200 feet per minute and that the pumping engine operate smoothly when pumping 15,000,000 gallons in 24 hours. From the data of the test, which is shown in this report under Division of Pumping, it will be seen that the engine fulfilled all of the requirements of the specifications and the same has been accepted and is now in regular service.

All equipment at both pumping stations was kept in repair by men employed in the department.

DISTRIBUTION DIVISION.

But very little water pipe was laid during the past year, it being less than within any one year since the construction of the water works; 11,348 lineal feet or 2.149 miles of 6-inch, 8-inch and 16-inch

ıains were laid, which, added to previously laid pipe, givse us a to-
al of 542.9 miles at the close of the year.

All new mains are laid under contract, the department furnishing
ll pipe, specials, gates and hydrants. Plans for the laying of the
ipe are prepared by the City Engineer, who also gives the neces-
ary lines and grades.

A total of 1108 tap and branch connections were made to our
ystem during the past year, of which number 799 were improvement
aps and extended to curb, only. This gives a total of 86,413 taps
nd branches to date. Of this number 65,721 are active taps, and
0,692 extended to curb only, or turned off at either curb or the
ıain, and not in use. Twenty-three fire hydrants were added to the
ervice, giving us 3,754 hydrants at the close of the year. There
ere also 40 new gate valves set, the total aggregating 4399 at the
nd of the year.

A total of 19 breaks in water mains occurred during the past
ear, of which number 11 were attributable to electrolysis. Two of
ıe breaks were of sufficient importance for special mention: On
une 16th, at about 11:00 o'clock PM, a joint in a 45-inch curve of
ıe 30-inch feeder main in St. Paul Avenue blew out at a point close
o the East bank of the Menomonee River in the Town of Wauwa-
osa, causing some damage by water to the adjoining property and
lso by undermining the foundation of one of the buildings. This
eing the principal feeder, which supplies the City of West Allis
nd that portion of the south side of the City of Milwaukee, lying
est of Seventeenth Avenue and south of South Pierce Street, it
as impossible to maintain satisfactory service as the only other
eder, a 12-inch main, was entirely inadequate to supply the de-
ıand of the City of West Allis and that part of the City of Milwau-
ee mentioned above. Most of the large factories in West Allis
ere compelled to shut down until the service was again restored.
s this feeder main is under about 90 pounds pressure and the curves
sed to lower the feeder main to the bed of the river were not
rengthened by bands and rods, the absence of such reinforcement
ndoubtedly caused the joint to pull apart. Lugs were fitted to the
ipe and specials with heavy bands, and connected together with
1¼-inch rods. This will prevent a recurrence of the accident. A
milar accident was averted when a leak was discovered in an elbow
f the 36-inch main in the shaft of the Knapp Street tunnel on Sep-
ember 20th. Two joints were cut in order to get the pipe back in
s original position. As the pipe was out of alignment two joints
ere re-run and the pipe fitted with bands and 1¼ rods and the line
ırned on again on October 16th.

Further details of the work performed by this division are given
the report of the Superintendent of Distribution.

KILBOURN PARK RESERVOIR.

The reservoir located in Kilbourn Park equalizes the pressure in th low service district. As its capacity is only 21,000,000 gallons whe the depth of water is 21.5 feet and our daily consumption is fa in excess of this figure, the reservoir no longer serves as a storag reservoir as it did in the early years of the water works. The aver age length of the reservoir is 515 feet; average width 310 feet. Whe the depth of the water in the resesvoir is 21.5 feet the elevation o water above datum is 150 feet.

The park connected with the reservoir is kept in the usual goo condition. The sum of $559.00 was expended for band concert given during the months of July and August which sum was pai out of the Water Fund.

The following table indicates the depth of water maintained i the reservoir each month of the past year:

Month	*Highest*	*Lowest*	*Mea*
January	21.90	17.70	20.3
February	22.00	16.20	19.6
March	21.90	16.10	19.8
April	21.90	16.70	19.3
May	21.80	15.40	19.7
June	21.90	15.40	19.9
July	21.70	18.50	20.0
August	21.90	13.40	20.3
September	21.70	16.00	20.2
October	21.70	17.60	21.2
November	21.60	16.90	20.3
December	21.70	16.80	20.5
Highest during year	22.00		
Lowest during year		13.40	
Average mean			20.1

METER DIVISION.

The number of new meter installations during the past year wa considerably below the average year, as the result of the fallin off in building operations on account of the war. Only 1161 ne installations were made and 414 meters were placed "out of service" on account of replacements with new meters or taken off on accoun of removal of buildings, etc., giving us a net gain of 747 meters and grand total of 65,072 meters at the close of the year.

A total of 14,824 meters or 22.7 per cent were repaired durin the year; 10,595 meters or 71.5 per cent requiring only adjustmen and cleaning due mostly to sand troubles, while 4,229 meters, o 28.5 per cent requiring new parts.

The total cost of operating this division was $52,675.41. This mount. however, is reduced in the sum of $23,026.77 collected from onsumers for meters repaired, making the net cost of operating his division, for the year, $29,648.64.

For full details of the operation of this division, see report of he Superintendent of Meters.

COLLECTION DIVISION.

The new system of reading meters and handling customers' ac-ounts in the Collection Division on what is known as the "block ystem" which was fully described in last year's report was put operation on June 1, 1918. A great deal of dupliction and un-ecessary wark performed by the meter readers and bookkeepers as eliminated by the introduction of the new system. Before the ystem was installed a thorough study was made of any possible ortcomings or defects. I am pleased to be able to state at this me that after six months of operation the new system has proven uccessful in every way, and more than measures up to our expec-tions.

The practice of returned receipted bills on all mail remittances was bandoned during the year at a considerable saving of postage to he department.

All billing is now done by machine. The recommendation of he Chief of the Collection Division to install bookkeeping machines hich fill in readings, make subtractions and extensions on the dger cards of all straight accounts should be given consideration s it would assure greater accuracy, do the work in much less time nd reduce errors to a minimum.

CONCLUSION.

In conclusion I desire to acknowledge my indebtedness for the earty co-operation and uniform courtesy extended to me by the ommissioner of Public Works and other city officials.

I also wish to express my appreciation at this time to the em-oyes of this department for their efficient and willing co-operation uring the past year.

The usual statistical matter relating to the Water Works is pre-nted in the following pages.

Yours truly,

H. P. BOHMANN,
Supt. of Water Works.

SUMMARY OF STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1918.

In form recommended by the New England Water Works Association.

MILWAUKEE WATER WORKS.

Milwaukee, Milwaukee County, Wisconsin.

GENERAL STATISTICS.

Population by census of 1910, 373,857. Present population estimated at 460,00
Date of original construction, 1872-1874.
By whom owned, City of Milwaukee.
Mode of supply (whether gravity or pumping), pumping.

PUMPING STATISTICS.

1. Builders of pumping machinery, Edward P. Allis Co., Allis-Chalmers Mf Co., Wisconsin Engine Co.
2. Description of fuel used:
   - A. Kind, bituminous.
   - B. Brand of coal, Pocahontas screenings, Youghiogheny screenings, Hoc ing Valley screenings, West Virginia Splint screenings and Pittsbu screenings.
   - C. Price of coal per ton of 2,000 lbs., delivered by team to Pumpi Station.

     North Point Station—Pocahontas screenings.....$.... to $7.0
     Youghiogheny screenings ..... 6.05 to 6.6
     W. V. Splint screenings..... 6.05 to 6.4
     Pittsburg screenings ..... 6.05 to 6.4

     High Service Station—Youghiogheny screenings .....$6.58 to $6.7
     Hocking Valley screenings ..... 6.20 to 6.5
   - D. Percentage of ash of coal consumed at North Point Pumping Statio 18.08.
   - E. Percentage of ash of coal consumed at High Service Pumping St tion, 11.51.
   - F. Wood, price per cord, none used.
3. Coal consumed:
   - A. North Point Pumping Station (for all purposes).....37,986,200 lb
   - B. North Point Pumping Station (while pumping).....37,908,200 lb
   - C. High Service Pumping Station (for all purposes)..... 2,383,200 lb
   - D. High Service Pumping Station (while pumping)..... 2,013,400 lb
4. Pounds of wood consumed ÷ 3 = equivalent amount of coal, none.
   - A. Amount of other fuel used, none.
5. Total equivalent coal consumed for the year (4) lbs., none.
6. A. Total pumpage for the year at North Point Pumping Station, whe

all direct pumpage from the lake is done, 22,848,616,040 gallons.

B. Total pumpage for the year at High Service Pumping Station where the water is repumped from the reservoir into the High Service district, 1,641,413,100 gallons.

7. Average static head against which pumps work (North Point Pumping Station low service), 150 feet.

8. A. Average dynamic head against which pumps work (North Point Pumping Station), low service 164.628, high service 282.308. Average of high and low service 211.454 feet.

B. Average dynamic head against which pumps work (High Service Pumping Station), 116.983 feet + suction head 9.720 feet + 128.30 feet elevation of gauge = 255.00 feet above datum.

9. A. Number of gallons pumped per pound of equivalent coal (5), none.

10. Duty = $\frac{\text{Gals. pumped (6.A) x 8.34 (lbs.) x 100 x dynamic head (8.A)}}{\text{Total fuel consumed while pumping at North Point Pumping Station (3B)}}$ = 106,293,985 lbs.

11. Cost of pumping figured on pumping station expenses, viz., North Point Pumping Station, $207,382.52; High Service Pumping Station, $21,838.29.

(a) Per million gallons pumped at North Point Pumping Station, $9.07.

(b) Per million gallons repumped at High Service Pumping Station, $13.30 + $9.07 = $22.37.

12. A. Per million gallons raised one foot (dynamic) at North Point Pumping Station, $0.0428.

B. Per million gallons raised one foot (dynamic) at High Service Pumping Station, $0.1049.

STATISTICS OF CONSUMPTION OF WATER.

1.	Estimated total population at date (city only)	460,000
2.	Estimated population on lines of pipe (city only)	460,000
3.	Estimated population supplied (includes suburbs)	485,000
*4.	Total consumption for the year	22,848,616,040 gallons
5.	Passed through meters	16,256,387,300 gallons
6.	Percentage of consumption metered	71.15
7.	Average daily consumption	62,598,948 gallons
8.	Gallons per day to each inhabitant (1), after deducting water furnished outside of city	121 gallons
*9.	Gallons per day to each inhabitant, including population supplied outside of city (3)	129.07 gallons
*10.	Gallons per day to each tap	952 gallons

(This is figured on taps in actual use, of which number 65,072 are metered, 192 elevator indicators and 457 unmetered.)

(The latter consists of 216 Automatic Fire Sprinkler Systems, and

Public Drinking Troughs, Bubblers, etc.)

11. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation ($546,243.44) $23.90.
12. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation, plus interest on bonds, $24.35.

*No deduction for slippage, estimated at 5 per cent.

STATISTICS RELATING TO DISTRIBUTION SYSTEM MAINS.

1. Kind of pipe, cast iron.
2. Sizes from 4 to 42 inch.
3. Extended 11,348 lineal feet, 2.149 miles.
4. Discontinued, lineal feet, none.
5. Total now in use, 542.911 miles.
6. Cost of repairs per mile, including valves and boxes, $14.61.
7. Number of leaks per mile, .134.
8. Length of pipe less than 4 inches in diameter, none.
9. Number of hydrants added during the year, 24—1 cut out.
10. Number of hydrants now in use, 3,754.
11. Number of stop gates added during the year, 40.
12. Number of stop gates now in use, 4,399.
13. Number of stop gates smaller than 4-inch, 1.

    (In addition to the above gates there are 2,227 gates from 2 inches to 8 inches controlling branch connections.)
14. Number of blow-off, 64.
15. Range of pressure on mains, 20 to 90 pounds.

16, 17, 18, 19, 20, 23, 24. All services put in by consumer.

21. Number of services (taps and branches) added during the year, 1,108.
22. Number of services connected to mains, 84,186 taps and 2,227 branches, a total of 86,413.
25. Number of new meters, added during the year, 1,161.
26. Number of meters now in use, 65,072 after deducting meters permanently off.
27. *Percentage of services metered, 99.
28. Percentage of receipts from metered water, 94.25.
29. Number of motors and elevators added, none; 6 taken out.
30. Number now in use, 192.

*Figured on services in actual use, of which 65,072 are metered, 192 elevator indicators and 457 unmetered. The latter consists of 216 Automatic Fire Sprinkler Systems, and Public Drinking Troughs, Bubblers, etc.

NOTE—A more complete report of the Water Works is published under separate cover, giving the detailed activities of each division of the Water Works, which report may be had on request.

STATEMENT OF COST OF CONTRACT HOUSE DRAIN AND WATER CONNECTION AND SPECIAL HOUSE DRAIN CONNECTIONS.
1918.

MONTH	Salaries Paid	Reimbursements	Profits on Special Inspections	Additions to Fund	Net Cost
January	.....	.....	.....	.....	.....
February	.....	.....	.....	.....	.....
March	.....	.....	.....	.....	.....
April	$ 484.00	.....	.....	.....	$ 484.00
May	442.75	.....	.....	.....	442.75
June	286.00	.....	.....	.....	286.00
July	261.25	.....	.....	.....	261.25
August	242.00	.....	.....	.....	242.00
September	77.00	.....	.....	.....	77.00
October	77.00	.....	.....	.....	77.00
November	.....	.....	.....	.....	.....
December	.....	.....	.....	.....	.....
TOTALS	$1,870.00	.....	.....	.....	$1,870.00
Additions to Fund					.....
Net Cost of Inspection					$1,870.00

RECAPITULATION.

**Gross Cost of Contract House Drain and Water Connection Inspection:

Profit on Special Inspections:

Net Cost of Inspections $1,870.00

**City is reimbursed for all special inspections by the house drain layers for whom such inspections are made.

ST. LOUIS PUBLIC LIBRARY

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN NINETEEN



ANNUAL REPORT

OF THE

Department of Public Works

COMPLIMENTS OF

PERCY BRAMAN

DEPUTY COMMISSIONER OF PUBLIC WORKS

MILWAUKEE, WISCONSIN

1919 REPORT

PLEASE EXCHANGE

THE LIBRARY OF THE
NOV 19 1942
UNIVERSITY OF ILLINOIS

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN NINETEEN

99

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



THE LIBRARY OF THE
NOV 1 9 1942
UNIVERSITY OF ILLINOIS

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN NINETEEN

99

Department of Public Works

PERCY BRAMAN

Deputy Commissioner of Public Works

CHARLES J. VAN ETTA.....*Supt. Bureau Street Construction and Repairs.*

CHARLES O. DAVIS.....*Supt. Bureau of Street Sanitation.*

DAVID McKEITH..... *Supt. Bureau of Bridges and Public Buildings.*

GEORGE F. STAAL .....*City Engineer, Bureau of Engineering.*

HENRY P. BOHMANN.....*Superintendent Water Works.*

FRANK H. MAYHEW.....*Head Clerk.*

Office of

THE DEPARTMENT OF PUBLIC WORKS

Milwaukee, January 2, 1920.

To the Honorable Mayor and Common Council of the City of Milwaukee:

Gentlemen:

Submit herewith the report of this department for the year 1919 under captions embracing the various bureaus of the department, these reports being over the signature of the bureau heads.

Courteously yours,

PERCY BRAMAN,

Deputy Commissioner of Public Works.

Milwaukee, Wis., January 2, 1920

Mr. Percy Braman:

Deputy Commissioner of Public Works.

Dear Sir:

I herewith submit the annual report of the Department of Public Works for the year ending December 31st, 1919.

The report embraces the work of the Audit and Account and the Assessment Division, also giving in detail the following information

Statement of net expenditures of the department and its various bureaus.

List of contracts awarded.

Number of permits issued, and revenue received.

List of streets placed under guarantee during 1919.

List of streets improved, with yardage and cost of each.

Inventory of the department by bureaus.

Statement of all special assessments.

The report of 1919 is compiled on the basis of the report of the preceding year with little or no material change.

Respectfully submitted,

FRANK H. MAYHEW,
Head Clerk.

Accounting Division

Statement of Net Expenditures for the Year Ending

December 31st, 1919, of the

DEPARTMENT OF PUBLIC WORKS

Divided According to its Bureaus.

1919.

GENERAL ADMINISTRATION.

Administration—		
Salaries—Commissioner, etc	$ 7,979.96	
Supplies—Office	33.84	
Contract or Open Order Service—Repairs, etc	16.50	
Fixed Charges—Advertising, etc	5,117.88	
	$13,148.18	
Audit and Accounts—		
Salaries—Chief Clerk, etc	$ 7,351.29	
Supplies—Office	605.04	
Contract or Open Order Service—Repairs, etc	64.00	
Equipment—Office	68.00	
	$ 8,088.33	
Special Assessments—		
Salaries—Chief Assessment Clerk, etc	$ 7,569.43	
Supplies—Office	162.65	
Contract or Open Order Service—Repairs	6.75	
Advertising and Appraisals	5,301.79	2,387.58
Equipment—Office	19.00	
	$ 13,059.62	$ 2,387.58

BUREAU OF STREET SANITATION

Superintendence—		
Salaries—Superintendent, etc.	$ 11,854.95	
Supplies—Office, etc.	570.38	
Contract or Open Order Service—Motor Vehicle Repairs, etc.	1,358.01	
Equipment—Office, etc.	100.00	
	$ 13,883.34	
Field—		
Salaries—Supervisors, etc.	$ 46,471.81	
Contract or Open Order Service—Auto, etc	2,160.00	
	$ 48,631.81	
Street Cleaning—		
Salaries—Labor, etc.	$ 214,677.44	
Supplies—General	4,626.09	
Minor Equipment—Tools, etc	4,018.51	
Contract or Open Order Service—Team Hire, etc	70,415.99	
Equipment—Self propelled apparatus	2,696.38	
	$ 296,434.41	

Sprinkling—

Supplies—Horse drawn apparatus, etc	$ 66.64	
Minor Equipment—Tools, etc	8.31	
Material—General	1.80	
Contract or Open Order Service—Team Hire, etc	53,635.86	
Fixed Charges—Rent, etc	9,427.50	
Equipment—General	1,493.55	
Miscellaneous Accounts Receivable		733.39
	$ 64,633.66	733.39

Flushing—

Salaries—Labor, etc	$ 8,704.30	
Supplies—Horse drawn apparatus, etc	8,469.93	
Minor Equipment—Tools, etc	101.58	
Material—General	529.42	
Contract or Open Order Service—Team Hire, etc	37,968.65	
Fixed Charges—Rent, etc	942.75	
Equipment—General	2,410.21	
Miscellaneous Accounts Receivable		24.60
	$ 59,126.84	24.60

Collection of Ashes and Rubbish—

Salaries—Labor, etc	$ 186,345.40	
Supplies—Motor Vehicles, etc	2,340.63	
Minor Equipment—Tools, etc	1,560.96	
Contract or Open Order Service—Team Hire, etc	184,713.30	
Equipment	935.00	
Special Fund—Fall Rubbish Collection	4,999.44	
Special Fund—Spring Clean Up	4,914.73	
	$ 385,809.46	

Garbage Collection—

Salaries—Superintendent, etc	$ 2,850.00	
Supplies—General, etc	358.40	
Material—General	9.11	
Contract or Open Order Service—Team Hire, etc	173,361.73	
Equipment	987.50	
Miscellaneous Accounts Receivable		75.00
	$177,566.74	75.00

Removal of Dead Animals—

Contract or Open Order Service—Team Hire, etc	$ 2,027.50	
Miscellaneous Accounts Receivable		62.00
	$ 2,027.50	62.00

Cleaning Catch Basins—

Salaries—Labor, etc	$ 14,381.62	
Supplies—General, etc	2,578.79	
Minor Equipment—Tools, etc	53.01	
Contract or Open Order Service—Team Hire, etc	5,070.11	
Equipment	268.61	
	$ 22,352.14	

Ward Yards—

Salaries—Superintendent, etc	$ 9,079.16	
Supplies—Horse drawn apparatus, etc	647.98	
Minor Equipment—Tools, etc	125.51	
Material—General	479.16	
Contract or Open Order Service—Team Hire, etc	1,874.74	
Fixed Charges—Rent, etc	180.00	
Equipment	157.95	
Special Fund—New Ward Yard Bldgs	4,980.98	
Special Fund—Sewer and Water Connections	691.14	
Miscellaneous Accounts Receivable		1,020.42
	$ 18,216.62	1,020.42

Minor Street Repairs

Salaries—Labor, etc	$ 25,624.02	
Material—General	11,307.39	
Contract or Open Order Service—Team Hire, etc	10,494.74	
Equipment—General	3,267.25	
	$ 50,693.40	

Public Drinking Fountains—

Salaries—Labor, etc	$ 229.11	
Minor Equipment—Tools, etc	3.12	
Material—General	1.25	
Contract or Open Order Service—Repairs, etc	8,886.80	
Special Fund	728.40	
	$ 9,848.68	

Skating Rinks—

Salaries—Labor, etc	$ 1,182.86	
Contract or Open Order Service—Team Hire, etc	178.91	
	$ 1,361.77	

Street Signs—

Salaries—Labor, etc	$ 608.41	
Supplies—General	15.01	
Material—General	5.09	
Special Fund	524.21	
	$ 1,152.72	

Miscellaneous—		
Special Funds—		
Lake Park Well	$ 2,462.50	
Street End Barricade	528.70	
Cinder	3,463.64	
Bay View Artesian Well	3,843.64	
Kinnickinnic River	559.72	
Traffic Lines	100.58	
Kinnickinnic Ave. Subway	1,780.01	
	$ 12,738.79	
Rotary Fund—		
Special Work—Labor, etc	$ 28,764.93	
Special Work—Team, etc	15,357.08	
Miscellaneous Accounts Receivable		37,296.62
	$ 44,122.01	37,296.62
Oiling—		
Salaries—Superintendent, etc	$ 20,213.39	
Supplies—Horse drawn apparatus, etc	664.09	
Minor Equipment	276.03	
Material—General	202,612.38	
Special Fund	6,668.70	
Contract or Open Order Service—Team Hire, etc	11,732.12	
Fixed Charges—Rent, etc	10.00	
Equipment	4,250.00	
Special Fund—Assessable	19,284.37	
Miscellaneous Accounts Receivable		2,814.54
	$ 265,711.08	2,814.54

BUREAU OF SEWERS.

Administration—		
Salaries—Superintendent, etc	$ 7,648.71	
Supplies—Office, etc	144.14	
Contract or Open Order Service—Repairs, etc	92.45	
	$ 7,885.30	
Store Yards—		
Salaries—Labor, etc	$ 5,450.27	
Supplies—Forage and Veterinary, etc	3,109.71	
Contract or Open Order Service—Repairs, etc	1,166.88	
Equipment	465.00	
Miscellaneous Accounts Receivable		570.63
	$ 10,191.86	570.63

Cleaning and Flushing—		
Salaries—Labor, etc	$ 27,953.02	
Supplies—General, etc.	500.47	
Material—General	52.47	
Contract or Open Order Service—Team Hire, etc	8,525.97	
Fixed Charges—Rent	3,771.00	
Equipment—General	650.00	
Miscellaneous Accounts Receivable		1,486.37
	$ 41,452.93	1,486.37
Repairs—		
Salaries—Labor, etc.	$ 14,861.79	
Material—Sewer, etc	1,046.91	
Contract or Open Order Service—General Service	361.70	
	$ 16,270.40	
Construction—City		
Materials	$ 114,534.58	
	$ 114,534.58	
Construction—Contract—		
Concrete Sewer	$ 51,950.28	
Pipe Sewer	89,868.90	
Miscellaneous Accounts Receivable		6,544.85
	$ 141,819.18	6,544.85

BUREAU OF BRIDGES AND PUBLIC BUILDINGS

Administration—		
Salaries—Superintendent, etc	$ 21,179.36	
Supplies—Office, etc	839.19	
Minor Equipment—Drawings, etc	11.00	
Contract or Open Order Service—Repairs, etc	1,831.44	
Equipment—Office, etc	116.05	
Miscellaneous Accounts Receivable		1,513.82
	$ 23,977.04	1,513.82
Bridges & Viaducts—		
Superintendence—		
Salaries—Superintendence	$ 900.65	
Contract or Open Order Service	155.11	
	$ 1,055.76	
Operation—		
Salaries—Bridge Tenders, etc	$ 175,303.09	
Supplies—Fuel, etc	3,719.21	
Minor Equipment—Tools, etc	76.88	
Contract or Open Order Service—Light, Power, etc	970.07	
Equipment	53.13	
	$ 180,122.38	

Maintenance—

Salaries—Iron Workers, etc	$ 44,018.94	
Supplies—Fuel, etc	530.07	
Minor Equipment—Tools, etc	640.22	
Material—General	13,504.05	
Contract or Open Order Service—Repairs, etc	12,299.60	
Special Fund—Bridge Repairs, etc	79,052.10	
Miscellaneous Accounts Receivable		69,667.2
	$ 150,044.98	69,667.2

City Hall—

Power and Heat—

Salaries—Engineer, etc	$ 16,463.59	
Supplies—Fuel, etc	29,264.76	
Minor Equipment—Tools, etc	68.35	
Material—General	1,193.00	
Contract or Open Order Service—Repairs, etc	1,951.97	
Fixed Charges—Insurance	110.76	
Special Fund	7.56	
Miscellaneous Accounts Receivable		109.3
	$ 49,059.99	109.3

Electrical Service—

Salaries—Electrician, etc	$ 6,857.82	
Supplies—General, etc.	1,118.64	
Minor Equipment—Tools, etc	23.31	
Material—General	1,494.01	
Contract or Open Order Service	11.50	
Miscellaneous Accounts Receivable		1,662.0
	$ 10,505.28	1,662.06

Janitorial Service—

Salaries—Custodian, etc	$ 25,003.23	
Supplies—Cleaning and Disinfecting	993.50	
Minor Equipment—Tools, etc	7.98	
Contract or Open Order Service—Repairs, etc	37.29	
	$ 26,042.00	

Elevator Service—

Salaries—Elevator Operators, etc	$ 6,285.33	
Material—General	1,327.38	
Contract or Open Order Service—Repairs, etc	542.37	
	$ 8,155.08	

Telephone Service—

Contract or Open Order Service - Telephone Service	$ 4,395.96	
Miscellaneous Accounts Receivable		241.17
	$ 4,395.96	241.17

General Service—

Salaries—Watchman, etc	$ 1,550.00	
Supplies—General	1,261.19	
Minor Equipment—Tools, etc	50.38	
Material—General	328.62	
Contract or Open Order Service—Repairs, etc	8,281.05	
Special Fund	1,353.13	
Miscellaneous Accounts Receivable		49.82
	$ 12,824.37	49.82

Natatoria—

Supplies—Superintendent, etc	$ 38,315.58	
Supplies—General, etc	22,181.22	
Minor Equipment—Tools, etc	273.34	
Material—General	301.65	
Contract or Open Order Service—Repairs, etc	14,734.29	
Fixed Charges—Insurance, etc	546.88	
Miscellaneous Accounts Receivable		727.22
	$ 76,352.96	727.22

Bathing Beaches—

Salaries—Superintendent, etc	$ 13,634.36	
Supplies—Fuel, etc	1,198.46	
Minor Equipment—Tools, etc	70.03	
Material—General	71.83	
Contract or Open Order Service—Repairs, etc	1,914.90	
Fixed Charges—Bond, etc	10.00	
Equipment—General	373.37	
Special Fund	7.50	
	$ 17,280.45	

Municipal Garage—

Salaries—Superintendent, etc	$ 12,994.54	
Supplies—General, etc	15,904.96	
Minor Equipment—Tools, etc	358.70	
Material—General	2,978.06	
Contract or Open Order Service—Repairs, etc	2,111.76	
Fixed Charges—Insurance, etc	471.50	
Equipment—Motor Vehicle, etc	15,002.00	
Miscellaneous Accounts Receivable		34,491.58
	$ 49,821.52	34,491.58

Markets—

Salaries—Market Master	$ 1,310.00	
Supplies—Fuel, etc	138.54	
Contract or Open Order Service—Repairs, etc	2,236.22	
Special Fund	10,397.81	
Special Fund—Emergency	110.18	
	$ 14,192.75	

Comfort Stations—

Supplies—Fuel, etc.	$ 76.50	
Contract or Open Order Service—General Service	596.66	
	$ 673.16	

Special Fund—

Rotary Fund	$ 16,371.55	
Miscellaneous Accounts Receivable		7,402.7
	$ 16,371.55	7,402.7

Construction—

South View Hospital—Isolation	$ 29,479.04
Bridge Shop	4,022.51
Blue Mound Sanitarium	41,522.81
West Side Police Station	3,205.25
North Avenue Bridge	2,770.42
Central Market	618.05
State Street Bridge	724.16
Fifth Avenue Natatorium	504.74
Council Chamber Gallery Remodeling	59.65
Cleveland Avenue Bridge	6,275.78
Sixteenth Street Viaduct	16,066.40
Mayor's Office	600.00
Cedar Street Bridge	.23
Twenty-seventh Street Viaduct Stairway	3,041.51
Police Station—1st Ave. and Mineral	573.52
City Hall—Eighth Floor	1,046.38
Armory Central Station	115.70
	$ 110,626.15

BUREAU OF STREET CONSTRUCTION AND REPAIRS.

Superintendence—

Salaries—Superintendent, etc	$ 7,275.00
Supplies—Office, etc	287.76
Contract or Open Order Service—Repairs, etc	2,010.01
Equipment—Office, etc	16.50
	$ 9,589.27

Testing Laboratory—

Salaries—Chemists, etc	$ 3,530.00
Supplies—Laboratory, etc	70.97
Minor Equipment—Apparatus, etc	4.00
Contract or Open Order Service—Repairs, etc	69.99
	$ 3,674.96

Pavement Repairs—		
Salaries—Foremen, etc	$ 14,183.43	
Supplies—General, etc	2,227.06	
Minor Equipment—Tools, etc	344.59	
Contract or Open Order Service	1,958.11	
Equipment—General, etc	7,500.85	
Special Fund	250,807.10	
Miscellaneous Accounts Receivable		40,161.33
	$ 277,021.14	40,161.33
Repair Shop—		
Salaries—Foremen, etc	$ 3,656.16	
Supplies—Fuel, etc	4.45	
Minor Equipment—Tools, etc	95.85	
Contract or Open Order Service—General	283.26	
Equipment—General	208.63	
	$ 4,248.35	
Construction—		
Special Fund	$ 31,490.97	
Creosote Block Paving	4,647.10	
Asphalt Paving	643,769.14	
Brick Paving	14,028.93	
Bituminous Concrete Paving	17,518.43	
Concrete Paving	260,046.38	
Stone Block Paving	115,724.46	
Sidewalks, Grading, etc	7,191.84	
	$ 1,094,417.25	
Rotary Fund—		
Special Fund—General	$ 22,569.98	
Miscellaneous Accounts Receivable		17,600.88
	$ 22,569.98	17,600.88
Sidewalk Repairs and Replacements—		
Special Fund	$ 36,852.52	
	$ 36,852.52	
Contract Retainer—		
Retainer paid	$ 60,260.00	
Interest paid	2,321.40	
	$ 62,581.40	

BUREAU OF RIVERS AND HARBORS

Harbor Commission—		
Salaries—Secretary	$ 2,280.00	
Supplies—Office	23.84	
Contract or Open Order Service—Postage, etc	28.60	
Fixed Charges—Publications	93.50	
Equipment—Office	8.65	
	$ 2,434.59	

Harbor Master—

Salaries—Harbor Master	$ 1,490.00	
Supplies—Motor Vehicle	67.79	
Contract or Open Order Service—Repairs, etc	91.30	
	$ 1,649.09	

Docking and Dredging—

Salary—Inspection	$ 960.00	
Dredging	25,000.00	
Miscellaneous Accounts Receivable		250.00
	$ 25,960.00	250.00

Harbor Improvements—

Special Fund	$ 155,302.57	
	$ 155,302.57	

MISCELLANEOUS

House Drains and Water Connections—

Connections	$ 23,326.27	
	$ 23,326.27	

City Property—

Rents Received		23,543.62
		$23,543.62

BUREAU OF ILLUMINATION

General Office—

Salaries—Engineer, etc	$ 11,085.88	
Supplies—General	60.64	
Contract or Open Order Service—General	28.40	
	$ 11,174.92	

Laboratory—

Salaries	$ 2,040.00	
Supplies—General	8.82	
Contract or Open Order Service—General	5.75	
Equipment	1,718.64	
	$ 3,773.21	

Storehouse—

Salaries	$ 255.00	
Supplies—General	13.03	
Contract or Open Order Service—General	436.67	
Fixed Charges—Rent, etc	1,914.85	
Miscellaneous Accounts Receivable		81.55
	$ 2,619.55	81.55

Street Lighting Operation—

Contract or Open Order Service—Operation	$ 243,304.37	
Miscellaneous Accounts Receivable		145.70
	$ 243,304.37	145.70

Street Lighting Maintenance—

Salaries	$ 26,827.87	
Supplies—General	9,548.79	
Minor Equipment—Tools, etc	101.72	
Contract or Open Order Service—Repairs, etc	1,389.19	
	$ 37,867.57	

Miscellaneous Service—

Safety Isle—Maintenance	$ 1,435.64	
Safety Isle—Construction	257.53	
Market Lighting	5.81	
Miscellaneous Accounts Receivable		709.42
	$ 1,698.98	709.42

Electric Light Plant—

Gas Unit Construction	$ 493,491.62	
Miscellaneous Accounts Receivable		5,196.21
	$ 493,491.62	5,196.21

List of Contracts

Awarded by

the

Department of Public Works

During the Year 1919

LIST OF CONTRACTS AWARDED BY THE DEPARTMENT OF PUBLIC WORKS DURING 1919.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
10	Mar. 17 1919.....	White Construction Co	Cut'g, fill'g, Asphalt Pav., Cem. Curb and Gut. N. Cem. Sidewalks on 5th Ave., from N. L. of Dakota Str. to S. L. of Montana St....	$ 6,823.83
11	Mar. 12, 1919.....	Badger Const. Co	Cut'g, Asphalt Pav., Brick Gutter, New Stra., L. S. Curb, curb reset on 19th Str., from N. L. of Grand Ave. to S. L. of Cedar Str.....	9,912.40
12	Mar. 19, 1919.....	Manger & McGucken C. C.	Cut'g, Brick Paving, N. S. L. S. Curb, S. L. Curb reset, old curb and gutter removed, on Clybourn Str. from W. L. of 25th Str. to E. L. of 27th Str.....	10,647.53
13	Mar. 17. 1919.....	White Const. Co.....	Cut'g, Filling, Asphalt Pav., C. C. Curb and Gut., Cem. Sidewalks, 3rd Ave. from N. L. of Dakota Str., to S. L. of Montana Str.....	7,601.25
14	Mar. 13, 1919.....	Badger Const. Co. (Assigned to White Construction Co.).....	Cutting, filling, Asphalt paving, Combin. Cem. Curb and Gutter on American Avenue, from S. L. of Manitoba Str. to N. L. of Oklahoma Ave.	6,408.55
15	Mar. 21, 1919.....	Retzlaff, Froemming & Bluhm.....	Cutg, fill'g, C. C. Curb and Gutter, New Cem. Sidewalks, McKinley Blvd., from W. C. L. of 34th Str. to E. C. L. of 35th Str.....	2,100,40
16	Mar. 12, 1919.....	Badger Const. Co.....	Cut'g, Brick Gutter, Asphalt Paving, N. S. L. Curb, O. S. L. Curb reset on 18th Str., from N. L. of Wells St., to S. L. of Cedar Str..	4,622.17
17	Mar. 17, 1919.....	Wisconsin Const. Co.....	Cutting, Bit. Conc. Paving, C. C. Curb and Gutter on Rogers Str., from W. L. of 26th Ave., to E. L. of 27th Ave.....	2,150.65
18	Mar. 17, 1919.....	White Construction Co.....	Cutg, Fill'g, Asphalt Paving, C. C. Curb and Gut., N. Cem. sidewalks, on Grant St., from W. L. of 26th Ave., to E. L. of 27th ave	3,662.43
19	Mar. 10, 1919.....	Badger Const. Co.....	Cut'g, Asphalt Pav., Brick Gutter, N. S. L. Curb., O .S. L. Curb reset, N. Rad. Curb, on 13th Str., from N. L. of Cedar Str. to S. L. of Vliet Str.....	24,610.88
20	Mar. 10, 1919.....	Badger Const. Co.....	Cut'g, Asphalt Pav., Brick Gutter, N. S. L. Curb, O. S. L. Curb reset, N. R. Curb, on 13th St., from N. L. of Vliet Str. to S. L. of Cherry Str.	4,971.87
21	Mar. 10, 1919.....	Badger Const. Co.....	Old asphalt removed, new Concrete Pav., new asphalt, old curb and Gut. removed, N. Comb. Cem. C. and G., Curb and Gutter reset, Pabst Ave., from W. L. of Sherman Blvd. to W. L. of 50th Str...	14,763.86

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
22	Mar. 13, 1919.....	Badger Const. Co.....	Cut'g, Fill'g, Asphalt Pav., Brick Gutter, N. S. L. Curb, O. S. L. Curb reset, N. Rad. Curb, at Woodstock Place, from E. L. of Prospect Ave. to W. L. of Summit Ave.....	3,390.33
23	Mar. 10, 1919.....	Badger Construction Co.....	Cut'g, Asphalt, Brick Gutter, N. S. L. Curb, O. S. L. Curb reset, N. Rad. Curb., 15th St., from N. L. of State Str. to S. L. of Vliet Str.	20,723.62
24	Mar. 13, 1919.....	Badger Construction Co.....	Cut'g, Fill'g, Asphalt, Comb. Cem. Curb and Gutter, Cement Curb Removed, old Cement Sidewalks removed, new Cem. Sidewalks, Hi Mount Blvd., from N. L. of Elm Str. to S. L. of North Ave....	6,294.21
25	Mar. 11, 1919.....	Frank Schomann	Cut'g, Filling, Cement Sidewalks, 29th Str., from N. L. of Concordia Ave., to S. L. of Townsend Str.....	1,131.48
26	Mar. 11, 1919.....	Frank Schomann.....	Cut'g, Filling, cement concrete, alley between 52nd and 53rd streets, Pabst Ave. and Elm Str.....	1,855.70
27	Mar. 21, 1919.....	Retzlaff, Froemming & Bluhm.....	Cut'g, old pavement removed, 8-inch concrete, north alley running east and west in blk. between 11th and 12th Sts., and Vliet Str. and Cold Spring Ave.....	1,217.49
28	Mar. 11, 1919.....	Frank Schomann	Cut'g, Filling, Cement Concrete, in alley bet. 45th and 46th Sts., and Lisbon and North Aves.....	1,591.30
29	Mar. 19, 1919.....	Frank Banaszak	Filling, cobblestone removed, new Cem. Concrete, alley bet. 3rd and 4th Aves., and Madison and Scott Streets.....	1,495.04
30	Mar. 11, 1919.....	Frank Schomann	Cut'g, Filling, old pavement removed, curb reset, Cement Concrete, walks remov. and replaced, alleys running E. & W., and center 20 feet of alley running N. & S., bet. 31st and 32nd Sts., Lloyd and Elm Sts.....	2,234.95
32	Mar. 26, 1919.....	Badger Construction Co.....	Cut'g, Filling, Asphalt, Comb. Cem. Curb and Gutter, Cement Sidewalks, 55th Str. from N. L. Pabst Ave. to S. L. of Elm.....	4,197.73

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
33	Mar. 31, 1919	John Weiher & Sons	Cut'g, Fill'g, old pavement remov., new S. L. Curb, New Granite O. S. L. Curb reset, new Rad. Curb, Muskego Ave., from Menomonee River to R. O. W. of C. M. & St. P. Ry. Co., and 13th St, from R. O. W. C. M. & St. P. Ry. to N. L. of St. Paul Ave., 4th Ward	17,048.03
34	Mar. 28, 1919	Badger Construction Co	Cut'g, Filling, Asphalt, Comb. C Curb and Gutter, cement sidewalks, Meinecke Ave., from W. L. of 45th Str. to a point 120 ft. west of 46th St., 22nd Ward	4,112.99
35	Mar. 28, 1919	Badger Construction Co.	Cut'g Fill'g, Asphalt, Comb. Cem. Curb & Gutter, Cem. sidewalks, 57th street, from N. L. of Pabst Ave., to S. L. of North avenue, 22nd ward	13,013.15
36	Mar. 28, 1919	Badger Construction Co	Cut'g, Asphalt, Comb. Cem. Curb and Gutter, cement sidewalks, 56th street, from N. L. of Pabst avenue to S. L. of North avenue, 22nd ward	14,714.60
37	Mar. 31, 1919	John Weiher & Sons	Cut'g, Filling, Cobblestone remov., Bit. Concrete, brick gutter, Lawton Place, from Harmon Str. to Garfield avenue, 6th ward.	2,983.03
38	Mar. 29, 1919	Frank Schomann	Cut'g, Cem. Concrete, alley bet. 52nd and 53rd streets, Elm street and North avenue	1,203.00
39	Mar. 31, 1919	Manger & McGucken Const. Co	Cut'g, old pavement removed, cement concrete, alley bet. 35th and 36th streets, Wright and Clarke streets	2,403.11
40	Mar. 31, 1919	John Weiher & Sons	Cut'g, Filling, cem. concrete, alley bet. 51st and 52nd streets, Elm and North avenue	1,562.86
41	Mar. 31, 1919	Retzlaff, Froemming & Bluhm	Cut'g, cement concrete, alley bet. 41st, Grant blvd., Center and Hadley streets	2,128.60
42	Mar. 29, 1919	Frank Schomann	Cut'g, stone pavement removed, cem. concrete, cem. walk removed, alley bet. 33rd and 34th streets, Cedar and State streets	2,488.00
43	Apr. 2, 1919	Frank Banaszak	Cut'g, Filling, cement concrete, alley bet. 9th and 10th avenues, and Arthur and Hayes avenues	3,969.94

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
44	Apr. 21, 1919.....	Kroening Const. Co.....	Cut'g, Filling, cement concrete alley bet. Orchard place, Greenfield avenue, 28th and 29th avenues.....	3,217.40
45	Mar. 31, 1919.....	Milwaukee General Const. Co.....	Cut'g, Filling, cement concrete, in alley bet. 16th and 17th streets, Fond du Lac avenue and Lloyd street.....	1,713.75
46	Mar. 31, 1919.....	Retzlaff, Froemming & Buhm.....	Cut'g, filling, cobblestone removed, cem. concrete, new stone curb new rad. curb, alley bet. 9th and 10th sts., Harmon and Lloyd sts.	1,507.12
64	Apr. 11, 1919.....	F. P. Caughlin Co.....	Cut'g, asphalt, brick gutter, N. S. L. curb, O. S. L. curb reset, new rad. curb, Bremen street, from S. L. of Hadley streets to S. L. of Burleigh street.....	26,915.22
65	Apr. 22, 1919.....	White Construction Co.....	Cut'g asphalt, brick gutter, N. S. L. curb, O. S. L. curb reset, radius curb, 14th st., from N. L. of Cedar st., to S. L. of Vliet st.....	27,133.56
66	Apr. 11, 1919.....	F. P. Caughlin Co.....	Cut'g, filling, conc. removed, asphalt, brick gutter, new rad. curb, cement sidewalks, new str. L. curb, Green Bay Avenue from N. L. of Graham street to City Limits, 8th street from a point 13 feet N. of S. L. of Lot 14, Blk. 1, Albert Heights, to N. L. of Albert Pl., 9th street, from a point 10 feet N. of S. L. of Lot 1, Blk. 2, Somer's Subd., No. 1, to a point 11.40 feet N. of S. L. of Lot 17, Blk. 4, Washington Park, No. 2, 21st and 25th wards.....	51,863.83
67	Apr. 11, 1919.....	F. P. Caughlin Co.....	Cut'g, filling, asphalt, brick gut., N. S. L. curb, O. cem. curb and gutter removed, Lawton Place, from North Line of Reservoir ave., to S. L. of Harmon street.....	4,381.10
68	Apr. 11, 1919.....	F. P. Caughlin Co.....	Cut'g, filling, asphalt, brick gutter, N. S. curb, N. rad. curb, cem. sidewalks, Teutonia avenue, from S. L. of Nash street to S. L. of Lake street; 20th street from S. L. of Franklin street to N. L. of Lot 59, Williamsburg Add., and 21st street, from a point 7 feet north of Lot 86, Blk. 2, Rosemont to a point 10 feet north of Lot 68, Blk. 1, Rosemont, in the 20th and 25th wards.....	44,756.23

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
69	Apr. 22, 1919.....	White Construction Co.....	Old asphalt removed, aspha't, br. gutter, new concrete, resurface, Vliet street, from W. L. of 32nd street to W. L. of 35th.....	7,264.61
70	Apr. 11, 1919.....	F. P. Caughlin Co.....	Asphalt, Maryland avenue, from N. L. of Kenwood Blvd., to S. L. of Hartford avenue.....	9,904.44
71	Apr. 17, 1919.....	Badger Const. Co.....	Cut'g, filling, light traffic asphalt, comb. C. C. and gut., cement sidewalks, 55th street, from N. L. of Elm street, to S. L. of North avenue	3,881.97
72	Apr. 21, 1919.....	John Weiher & Sons.....	Cut'g, removing cobblestone, brick gut., new bituminous concrete, alley bet. 18th and 19th streets, Wells and Cedar streets.....	1,210.71
73	Apr. 18, 1919.....	Milwaukee Gen'l Const. Co.....	Cut'g, filling, removing cobblestone, new cement concrete, alley between Grove street, First avenue, Washington and Scott streets	1,201.32
74	Apr. 18, 1919.....	Milwaukee Gen'l Const. Co.....	Cut'g, filling, cement concrete, alley bet. Madison street, Greenfield avenue, and 1st and 2nd avenues.....	1,071.42
75	Apr. 15, 1919.....	Manger & McGucken Const. Co.....	Cut'g, filling, removing cobblestone, cement concrete, alley between 15th and 16th streets, Vliet and Cherry streets.....	1,437.94
76	Apr. 18, 1919.....	Milwaukee Gen'l Const. Co.....	Cut'g, filling, cement concrete alley, between 8th and 9th avenues, Hayes and Arthur avenues.....	4,028.93
77	Apr. 15, 1919.....	Frank Banaszak	Cut'g, filling, cement concrete, alley between 8th and 9th avenues, and Arthur and Harrison avenues.....	730.34
78	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, filling, cement concrete, brick pavement removed, alley between 32nd and 33rd streets, Canal and Park Hill.....	1,327.16
79	Apr. 15, 1919.....	Manger & McGucken Const. Co.....	Cut'g, filling, repaving with limestone, cement concrete, alley between Cherry and Galena streets, R. O. W. C. M. & St. P. Ry. and 32nd street.....	1,099.83
80	Apr. 26, 1919.....	Kroening Const. Co.....	Cut'g, cement concrete, alley between Lenox and Logan avenues, Montana and Dakota streets.....	1,758.37

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
81	Apr. 15, 1919.....	Manger & McGucken Const. Co....	Cut'g, removing and replacing cement walks, removing pavement, cement concrete, alley between 38th and 39th streets, Brown and Pabst avenue	1,474.78
82	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g filling, cement concrete, in alley between 49th and 50th streets, Vine street and Washington blvd.....	1,864.56
83	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, filling, cement concrete, alley between Grant, and Sherman blvd., Center and Hadley streets.....	2,317.86
84	Apr. 11, 1919.....	Retzlaff, Froemming & Bluhm.....	Cut'g, cem, concrete, alley between Buffum and Richards, Concordia and George	2,625.28
85	Apr. 26, 1919.....	Kroening Const. Co.....	Cut'g, cement concrete, paving alley between Hadley and Locust streets, Island avenue and First street.....	2,562.40
86	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, filling, cement concrete, alley between Holton and Buffum streets, Hadley and Locust streets.....	2,685.36
87	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g filling, cement concrete, alley between Humboldt avenue and Weil street, Chambers and Burleigh streets.....	1,965.03
88	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, removing pav., cement concrete alley between 34th and 35th streets, Meinecke avenue and Wright street.....	1,726.16
89	Apr. 14, 1919.....	Frank Schomann	Cut'g, filling, cement concrete alley, between 45th and 46th street, North and Meinecke avenues.....	1,174.90
90	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, cement concrete, pavement removed, alley between 31st and 32nd streets, North and Meinecke avenues.....	2,167.37
91	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, cement concrete, alley between 56th and 57th streets, Pabst avenue and Elm.....	2,104.48
92	Apr. 26, 1919.....	Kroening Construction Co.....	Cut'g, filling, removing pavement, cement concrete, alley between 37th and 38th streets, Clarke and Center streets.....	2,552.21
93	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, filling, cement concrete, alley between 49th and Hi Mount, Elm street and North avenue.....	1,554.98

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
94	Apr. 11, 1919.....	Retzlaff, Froemming & Bluhm.....	Cut'g, cement concrete, alley between Grant and Sherman blvds., Clarke and Center streets.....	2,664.66
95	Apr. 12, 1919.....	Blodgett-Clayton Const. Co.....	Cut'g, cement concrete, filling, alley between Greenfield avenue, Scott street, Layton blvd., and 23rd avenue.....	2,453.00
104	Apr. 24, 1919.....	White Construction Co.....	Cut'g, asphalt, brick gutter, N. S. L. curb, O. S. L. curb reset, N. rad. curb, Becher street, from Windlake avenue to 11th avenue.....	27,561.42
105	Apr. 24, 1919.....	White Construction Co.....	Cut'g filling, asphalt, comb. cem. curb and gutter, cement sidewalks, Becher st., from W. L. of 26th ave., to E. L. of 27th ave...	3,781.63
106	Apr. 26, 1919.....	Kroening Construction Co.....	Cut'g, filling, old stone pavement removed, granite on 8-inch foundation, Canal street, from W. L. of First avenue to W. L. of Muskego avenue	70,886.13
107	Apr. 24, 1919.....	White Construction Co.....	Cut'g, asphalt, brick gutter, N. S. L. curb, rad, curb, 18th avenue from Rogers street to N. L. of Merrill street.....	4,553.40
108	Apr. 24, 1919.....	White Construction Co.....	Concrete, asphalt removed, asphalt repav., Hayden Blk. gutter, N. S. L. curb, Old S. L. curb reset, new rad. curb, Florida street, from W. C. L. of Reed street, to W. C. L. of Grove street.....	12,961.05
109	Apr. 25, 1919.....	Badger Construction Co.....	Cut'g, Asphalt, comb. cem. curb and gutter, old curb removed, cement walks, 41st street, from S. L. of Locust street to S. L. of Burleigh street	11,249.51
110	Apr. 24, 1919.....	White Construction Co.....	Cut'g, filling, light traffic asphalt, comb Cem. C. and gutter, Manitoba street, from 8th avenue to American avenue.....	8,766.35
111	Apr. 26, 1919.....	Kroening Construction Co.....	Cut'g, filling, cement concrete, alley bet. 7th and 8th Sts., and Prairie and Chestnut Sts.....	859.00
112	Apr. 24, 1919.....	Frank Banaszak	Filling, Cem. concrete old pav. removed, alley bet. Hanover and Greenbush Sts., Virginia and Florida Sts.....	1,179.25
113	Apr. 24, 1919.....	Milwaukee General Const. Co.....	Cut'g, filling, old pavement removed, cement concrete, alley betw. running N. and S., Mitchell St., Windlake Ave, 2nd and 3rd Aves	1,992.07

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
114	Apr. 24, 1919.....	Milwaukee General Const. Co.....	Cut'g, filling, old pavement removed, cement concrete, alley running N. and S. bet. Lapham and Mitchell Sts., 2nd and 3rd Aves.	3,667.35
115	Apr. 24, 1919.....	Frank Banaszak	Cut'g, filling, old pavement removed, cement concrete, alley betw. Burnham and Rogers Sts., 5th and 6th Aves.....	2,565.90
116	Apr. 24, 1919.....	Milwaukee General Const. Co.....	Cut'g, cement concrete, alley betw. 15th and 16th Sts., Cherry and Galena Sts.	1,295.30
117	Apr. 24, 1919.....	Ryback & Sadowski.....	Cut'g, cement concrete, alley betw. Burnham and Rogers Sts., and 24th and 25th Aves.....	2,369.42
118	Apr. 24, 1919.....	Frank Banaszak	Cut'g, filling, cement concrete, alley betw. 1st and 2nd Aves, Mitchell and Maple Sts.....	2,091.15
119	Apr. 24, 1919.....	Milwaukee General Const. Co.....	Cut'g, filling, old pavement removed, cement concrete, alley betw. Grove St., 1st Ave., Mitchell and Maple Sts.....	1,268.54
120	Apr. 28, 1919.....	Retzlaff, Froemming & Bluhm..... (Assignee of Kehrein Const. Co..	Filling, removing cobblestones, cement concrete, alley betw. 1st St., Island Ave., North Ave. and Lee St.....	2,786.60
121	Apr. 25, 1919.....	Frank Schomann	Cutting, filling, cement concrete, alley betw. 45th and 46th Sts., Clarke and Center Sts.....	2,205.52
122	Apr. 26, 1919.....	Retzlaff, Froemming & Bluhm.....	Cutting, cement concrete, south 254 feet of alley betw. 49th St., Hi Mount, Pabst Ave. and Elm St.....	821.75
123	Apr. 25, 1919.....	Frank Schomann	Cutting, filling, cement concrete, alley betw. 45th and 46th Sts Meinecke Ave. and Wright St.....	2,170.30
124	Apr. 25, 1919.....	Frank Schomann	Cutting, filling, old straight curb reset, old pavement removed, cement concrete, alley running N. and S. and east 136 feet of alley running E. and W., betw. 36th and 37th Sts., North and Meinecke Aves.	1,778.76
125	Apr. 25, 1919.....	Frank Schomann	Cutting, old pavement removed, cement concrete, curb reset, alley betw. 37th and 38th Sts., Meinecke Ave and Wright St.....	2,241.36
126	Apr. 25, 1919.....	Frank Schomann	Cut'g, filling, cement concrete, alley betw. Hi Mount Blvd., 51st St., Pabst Ave. and Elm St.....	2,401.90

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
127	Apr. 25, 1919.....	Frank Schomann	Cutting, filling, old pavement removed, cement concrete, alley betw. 33rd and 34th Sts., Meinecke Ave. and Wright St.....	1,287.82
128	Apr. 25, 1919.....	Frank Schomann	Cutting, cement concrete, alley betw. Sherman Blvd., 44th St., Pabst and Lisbon Aves.....	660.44
129	Apr. 25, 1919.....	Frank Schomann	Cutting, filling, old pavement removed, cement concrete, curb reset, alley betw. 37th and 38th, Wright and Clarke Sts.....	2,265.60
130	Apr. 25, 1919.....	Frank Schomann	Cutting, cement concrete, south one-half of alley running N. and S. betw. 42nd, Sherman Blvd., Pabst Ave. and Eiring Pl.....	430.00
131	Apr. 25, 1919.....	Frank Schomann	Cutting, cement walk removed and replaced, old pavement removed, cement concrete, in alley betw. 28th and 29th Sts., Meinecke Ave. and Wright St.....	2,476.57
132	Apr. 24, 1919.....	Milwaukee Gen'l Const. Co.....	Cutting, cement concrete, alley betw. 12th St., Louis Ave., Burleigh and Ring Sts.....	4,082.44
133	May 1, 1919.....	Badger Construction Co.....	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, 55th Sts., from Pabst Ave. to the South line of Judge Elliott's Add., 22nd ward.....	2,896.30
136	May 9, 1919.....	F. P. Caughlin Co.....	Cutting, filling, pavement removed, Lt. Traffic asphalt, N. C. cement curb and gutter, cement curb reset, cement sidewalks removed, new cement sidewalks, 18th St., from E'Ly line of Teutonia Ave., to south Curb line of Davis Sts.....	6,777.37
137	May 9, 1919.....	Wisconsin Construction Co.....	Cutting, filling, bit. concrete, brick gutter, N. S. L. curb, N. Rad. L. curb, new cement sidewalks, Graham St., from E'Ly line of Atkinson Ave., to W'ly of Green Bay Ave.....	10,575.40
138	May 7, 1919.....	Badger Construction Co.....	Cutting, traffic asphalt, brick gutter, curb reset, new radius curb, Pryor Ave., from Kinnickinnic Ave. to Ellen St.....	13,103.75
139	May 9, 1919.....	F. P. Caughlin Co.....	Cutting, traffic asphalt, brick gutter, N. S. L. curb, old Str. L. curb reset, new radius curb, 6th St., from S. L. of Concordia Ave. to S. L. of Davis St.....	8,069.83

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
140	May 5, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley running N. & S. bet. Chambers and Burleigh, 26th and 27th Sts., 20th ward.....	1,936.75
141	May 5, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 47th and 48th Sts., Pabst Ave. and Elm St.....	778.40
142	May 12, 1919.....	Milwaukee Gen'l Const. Co.....	Cutting, Br. repaving, cement concrete, alley running N. & S. bet. 29th and 30th Sts., Lloyd and North Ave.....	2,400.90
154	May 24, 1919.....	F. P. Caughlin Co.....	Cutting, hard sandstone pavement, Lt. traffic asphalt, brick gutter paving, new str. limestone curb, old curb reset, new radius curb, 6th St., from N. L. of Burleigh St. to S. L. of Concordia Ave., in the 21st and 25th wards.....	14,505.48
155	May 28, 1919.....	Frank Banaszak	Filling, removing cobblestone pavement, cement concrete pavement alley between 23rd, 24th, Vliet and Cherry Sts., 9th ward.....	3,913.54
156	May 20, 1919.....	Retzlaff, Froemming & Bluhm.....	Cutting, filling, removing old pavement, cement concrete paving, alley between 23rd, 24th, Vliet and Cherry Sts., 9th ward.....	3,913.54
157	May 19, 1919.....	Frank Schomann	Cutting, cement concrete, alley between 34th and 35th strees, Clarke and Center Sts.....	2,315.55
158	May 19, 1919.....	Frank Schomann	Cutting, removing old pavement, cement concrete, alley between 35th and 36th Sts., and North and Meinecke avenues.....	2,524.20
159	May 20, 1919.....	Retzlaff, Froemming & Bluhm.....	Cutting, cement concrete, alleys between 35th and 36th, Clarke and Center Sts., 22nd Ward.....	2,558.75
160	May 20, 1919.....	Retzlaff, Froemming & Bluhm.....	Cutting, filling, cement concrete pav., alley, between 51st and 52nd Sts., Pabst Ave. and Elm St.....	1,912.00
161	May 20, 1919.....	Ryback & Sadowski.....	Cutting, cement concrete, alley betwen 24th and 25th Aves., Lincoln Ave. and Grant St.....	2,489.50
165	June 9, 1919	Badger Construction Co.....	Cutting, standard sheet asphalt, brick gutter, new limestone curb, curb reset, Cherry St., from W. L. of 10th St. to E. L. of 11th St., 9th Ward	3,080.90

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
166	June 9, 1919	Manger & McGucken Const. Co.	Cutting, filling, gravel filling, remov. recutting and repaving granite block, removing old cement walks, new str. L. S. curb, old limestone curb reset, cement sidewalks, Commerce St., from Poplar to Walnut St., in the 2nd and 6th Wards	39,187.77
167	June 9, 1919	Manger & McGucken Const. Co.	Cutting, filling, remov. old pavement, new granite pavement, alley between East Water and Broadway, Huron and Detroit Sts, 3rd Ward	2,588.55
168	June 9, 1919	Manger & McGucken Const. Co.	Cutting, filling, removing old pavement, new granite pavement, alley in block between East Water, Broadway, Buffalo and Detroit, 3rd Ward	2,535.30
169	June 9, 1919	Manger & McGucken Const. Co.	Cutting, removing old pavement, new granite pavement, alley in blk. bet. Broadway, Milwaukee, Chicago and Buffalo Sts., 3rd Wd	2,559.55
170	June 7, 1919	Kehrein Construction Co.	Filling, removing old pavement, cement concrete paving, alley bet. 14th and 15th, Galena and Walnut Sts., 9th Ward	1,461.15
171	June 7, 1919	Kehrein Construction Co.	Cutting, filling, removing old pavement, cement concrete paving, in alley bet. 19th and 20th Sts., Vliet and Cherry Sts., 9th Ward	2,529.63
172	June 7, 1919	Kehrein Construction Co. (Assigned to Retzlaff, Froemming & Bluhm)	Cutting, filling, removing old pavement, cement concrete paving, in alley bet. 10th and 11th, Lloyd Sts. and Garfield Ave., 10th Ward	1,539.37
173	June 7, 1919	Kehrein Construction Co.	Cutting, filling, removing old pavement, cement concrete paving, in alley bet. 9th and 10th Sts., Lloyd and Garfield, 10th Ward	1,494.72
174	June 4, 1919	Milwaukee Gen'l Const. Co.	Cutting, removing old pavement, cement concrete paving, in alley running N. & S. in blk. bet. 34th and 35th, Clybourn and Sycamore Sts., in the 16th Ward	717.66
175	June 9, 1919	Blodgett-Clayton Const. Co.	Cutting, cement concrete paving, alley bet. 31st and 32nd, Clybourn and Sycamore Sts., in the 16th Ward	1,284.40
176	June 9, 1919	Blodgett-Clayton Const. Co.	Cutting, removing old pavement, cement concrete paving, alley in blk. bet. 33rd, 34th, Clybourn and Sycamore Sts., 16th Ward	1,675.74

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
177	June 4, 1919	Milwaukee Gen'l Const. Co.	Cutting, cement concrete, paving alley bet. West 24th, 25th, Chambers and Burleigh Sts., 20th Ward	3,338.68
178	June 4, 1919	Milwaukee Gen'l Const. Co.	Cutting, cement concrete pavement, alleys in blk. bet. West 24th, 25th, Center and Hadley Sts., 20th Ward	2,877.00
179	June 4, 1919	Milwaukee Gen'l Const. Co.	Cutting, cement concrete paving, alley bet. 16th, 17th, Hadley and Locust Sts., in the 20th Ward	1,815.40
181	June 9, 1919	Milwaukee Gen'l Const. Co.	Cutting, filling, old pavement removed, cement concrete paving, alley running E. & W. bet. 2nd and 3rd Aves., Lapham and Mitchell Sts., 8th Ward	1,109.75
182	June 10, 1919	F. P. Caughlin Co.	Cutting, standard sheet asphalt, brick gutter, N. S. L. curb, O. S. L. curb reset, new rad. curb, Biddle St., from Cass to Astor St., 3rd Ward	9,631.02
187	June 19, 1919	R. H. Gumz	Cutting, filling, Adams Ave., from Russell Ave. to Montana St.	1,806.14
188	June 19, 1919	R. H. Gumz	Cutting and filling, Montana St., from Howell Ave. to Pine	5,755.54
189	June 19, 1919	R. H. Gumz	Cutting, filling, Quincy Ave., from Russell Ave. to Montana St.	2,014.20
190	June 19, 1919	R. H. Gumz	Cutting, filling, Taylor Ave. from Russell Ave. to Montana St.	2,453.00
200	June 30, 1919	Albert H. Prange	Cutting, old pavement removed, sandstone paving, new S. L. curb, old str. L. curb removed, new rad. curb, Clinton St., from Greenfield Ave. to Kinnickinnic Ave., and Kinnickinnic Ave., from Clinton to Mitchell St., 12th Ward	36,198.31
201	July 2, 1919	Badger Construction Co.	Cutting, asphalt, brick gutter, N. S. L. curb, O. S. L. curb reset, new rad. curb, 8th St., from N. L. of North Ave. to S. L. of Center St., 7th Ward	22,868.96
202	July 2, 1919	White Construction Co. (Assigned to Badger Construction Co.)	Cutting, filling, asphalt paving, Comb. cement curb and gutter, new cement sidewalks, 57th St., 58th, 59th, also 56th Sts., from South City Limits to south line of Pabst Ave., 19th Ward	6,588.97

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
203	July 2, 1919.....	White Construction Co.....	Old pavement removed, asphalt paving, N. S. L. curb, O. S. L. curb reset, new cement sidewalks, Howell Ave., from Oklahoma Ave., to Dover Place, 17th Ward.....	18,417.64
204	July 14, 1919.....	F. P. Caughlin Co.....	New concrete, old asphalt removed, Standard sheet asphalt, new cement curb and gutter, old cem. curb and gutter reset, N. S. cement curb, Shepard Ave., from N. L. of Kenwood Blvd., to S. L. of Hartford Ave., in the 18th Ward.....	6,743.19
205	July 15, 1919.....	Kroening Const. Co.....	Cutting, filling, cement concrete, alley, between Lake, Oregon, Barclay and Clinton Sts., 5th Ward.....	1,513.20
206	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 23rd and 24th Sts., Clarke and Center Sts., 7th Ward.....	3,235.18
207	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alleys, bet. 17th and 18th Sts., North and Meinecke Aves., 7th Ward.....	2,829.91
208	July 15, 1919.....	Kroening Construction Company....	Cutting, cement concrete, alley bet. 9th and 10th Sts., Garfield and North Aves., Tenth Ward	1,265.72
209	July 15, 1919.....	Kroening Construction Company....	Cutting, cement walks removed, stone curb removed, cement concrete, alley running N'Wly and S'Ely bet. 16th and 17th Sts. Fond du Lac Ave. and Lloyd St., 10th Ward.....	1,016.75
210	July 5, 1919.....	Frank Banaszak	Cutting, filling, cement concrete, alley bet. 3rd and 4th Aves., Dakota and Manitoba Sts., 14th Ward.....	2,067.21
211	July 3, 1919.....	Ryback & Sadowski.....	Cutting, filling, removing old pavement, cement concrete, alley east and west, bet. 3rd and 4th Aves., Lincoln and Hayes Aves., 14th Ward	585.02
212	July 1, 1919.....	Milwaukee General Const. Co.....	Cutting, cement concrete, alley bet. Kinnickinnic, Linus, Conway and Woodward Sts., in the 17th Ward.....	2,958.84
213	July 1, 1919.....	Milwaukee General Const. Co.....	Cutting, filling, cement concrete, alley bet. Idaho, Manitoba, Herman Sts. and Logan Ave., 17th Ward.....	1,604.19

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
214	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 35th and 36th Sts., Locust and Chambers Sts., 20th Ward.....	1,801.00
215	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, filling, cement concrete, alley bet. 40th and 41st Sts., Hadley and Locust Sts., 20th Ward.....	2,205.82
216	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, filling, cement concrete, alley bet. 36th and 37th Sts., Chambers and Burleigh Sts., 20th Ward.....	2,113.25
217	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 35th and 36th Sts., Hadley and Locust Sts., 20th Ward.....	1,891.18
218	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, filling, cement concrete, alley bet. 39th and 40th Sts., Hadley and Locust Sts., 20th Ward.....	2,142.02
219	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 36th and 37th Sts., Hadley and Locust Sts., 20th Ward.....	2,239.65
220	July 2, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 36th and 37th Sts., Locust and Chambers Sts., 20th Ward.....	2,267.06
221	July 1, 1919.....	Froemming Brothers	Cutting, cement concrete, alley bet. Booth and Holton Sts., and Auer and Concordia Aves., 21st Ward.....	2,713.74
222	July 1, 1919.....	Froemming Brothers	Cutting, cement concrete, alley bet. North Pierce, Booth, Auer Ave. and Burleigh St., 21st Ward.....	3,377.52
223	July 1, 1919.....	Froemming Brothers	Cutting, filling, cement concrete, alley bet. Holton, Buffum, Concordia Ave. and George St., 21st Ward.....	2,862.14
224	July 3, 1919.....	Ryback & Sadowski.....	Cutting, cement concrete, north 240 ft. of alley bet. 24th and 25th Aves., Grant and Becher Sts., 24th Ward.....	897.36
228	July 18, 1919.....	Badger Construction Co.....	Cutting, asphalt, brick gutter, new S. L. curb, old S. L. curb reset, new rad. curb, 8th St., from N. L. of Center Str. to S. L. of Burleigh St., 25th Ward.....	24,606.09
229	July 15, 1919.....	White Construction Co.....	Cutting, asphalt, hard sandstone, brick gutter, N. S. L. curb, O. S. L. curb reset, new rad. curb, First Ave., from a pt. 150 ft. south of Maple St., to N. L. of Lincoln Ave., 12th Ward.....	30,968.85

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
230	July 15, 1919.....	R. H. Gumz.....	Cutting, filling, cement sidewalks, 9th Ave., from Dakota St. to the R. O. W. of C. & N. W. Ry. Co., 14th Ward.....	2,491.01
231	July 17, 1919.....	F. P. Caughlin Co.....	Cutting, filling, asphalt, comb. cem. curb and gutter, cement sidewalks on Townsend St., from W. L. of 20th St. to E. L. of 24th St., 20th Ward	18,124.68
232	July 17, 1919.....	F. P. Caughlin Co.....	Cutting, filling, asphalt, comb. cem. curb and gutter, cement sidewalks, 20th St., from N. L. of Keefe Ave. to N. L. of Franklin St. 20th Ward	17,958.54
233	July 15, 1919.....	Froemming Brothers	Cutting, new cement sidewalks, Wright St. from W. L. of Bolton St. to E. L. of Dousman Str., 13th Ward.....	1,561.95
234	July 26, 1919.....	Kehrein Const. Co.....	Cutting, cement concrete, north alley running E. and W. bet. 17th and 18th Sts., Chestnut St., and Cold Spring Ave., 2nd Ward.....	1,029.30
235	July 26, 1919.....	Kehrein Const. Co.....	Cutting, cement concrete, alley bet. 15th and 16th Sts., Meinecke Ave. and Wright St., 7th Ward.....	2,503.08
236	July 15, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 36th, 37th, Center and Hadley Sts., 20th Ward	2,483.46
237	July 15, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, filling, cement concrete, alley bet. 35th, 36th, Chambers and Burleigh Sts., 20th Ward.....	2,473.92
238	July 15, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, cement concrete, alley bet. 34th, 35th, Burleigh Sts., and Auer Ave., 20th Ward.....	2,585.19
239	July 15, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, filling, old pavement removed, cement concrete, alley bet. 28th, 29th, Burleigh and Auer Ave., 20th Ward.....	2,194.12
240	July 15, 1919.....	Blodgett-Clayton Const. Co	Cutting, filling, cement concrete, alley bet. 39th, 40th, Chambers and Burleigh Sts., 20th Ward	1,863.84
241	July 15, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, filling, cement concrete, alley bet. 34th, 35th, Hadley and Locust Sts., 20th Ward.....	1,792.48
242	July 15, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, sidewalks removed and replaced, cement concrete, alley bet. 33rd, 34th, Hadley and Locust Sts., 20th Ward.....	1,880.14

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
243	July 15, 1919.....	Froemming Brothers	Cutting, filling, cement concrete, in alley bet. Richards, Island Ave., Burleigh and Chambers Sts., 21st Ward.....	4,566.48
244	July 15, 1919.....	Froemming Brothers	Cutting, filling, cement concrete, alley bet. North Pierce, Booth, George Sts., and Keefe Ave., 21st Ward.....	3,272.88
245	July 15, 1919.....	Froemming Brothers	Cutting, cement concrete, alley running north and south, bet. Buffum, Richards, Burleigh Sts., and Auer Ave., 21st Ward.....	1,819.20
246	July 26, 1919.....	Kehrein Const. Co.....	Cutting, cement concrete, alley bet. Fratney, North Pierce, Brattle Sts. and Keefe Ave., 21st Ward.....	4,441.37
247	July 15, 1919.....	Blodgett-Clayton Const. Co.....	Cutting, filling, cement concrete, alley bet. Scott, Madison Sts., 26th and 27th Aves., 23rd Ward.....	2,438.75
248	July 16, 1919.....	Ryback & Sadowski.....	Cutting, cement concrete, alley bet. 25th and 26th, Greenfield Ave., and Scott St., 23rd Ward.....	2,792.20
256	Aug. 8, 1919	Badger Construction Co.....	Cutting, radius curb, asphalt, brick gutter, old curb reset, Becher St., from W. L. of Grove St. to E. L. of Second Ave.....	10,640.13
257	Aug. 14, 1919	John Weiher & Sons.....	Cutting, sandstone, new limestone curb, old cement curb reset, Becher Str., from W. L. of Clinton St. to Kinnickinnic river.....	14,615.65
258	Aug. 8, 1919	Badger Construction Co.....	Cutting, filling, asphalt, comb. cem. curb and gutter, Beulah Ave. from S'Wly line of Russell Ave., to S'E'y line of Estes St.....	27,767.31
259	Aug. 8, 1919	Badger Construction Co.....	Cutting, asphalt, comb. cem. curb and gutter, cement sidewalks, Fernwood Ave., from the E. L. of New York Ave. to W. L. of Indiana Ave.	6,977.70
260	Aug. 16, 1919	Milwaukee General Const. Co.....	Cutting, cement sidewalks, E. S. of Kinnickinnic Ave., from Oklahoma Ave., to City Limits, 17th Ward.....	623.86
261	Aug. 8, 1919	Badger Construction Co.....	Cutting, asphalt, comb. cem. curb and gutter, new cement sidewalks, Locust St., from W. L. of 33rd St., to E. L. of 35th St.....	9,790.87
262	Aug. 8, 1919	Badger Construction Co.....	Cutting, asphalt, brick gutter, limestone curb, curb reset, 23rd St., from N'ly line of Lisbon Ave. to South Line of Walnut St.....	832.45

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
263	Aug. 11, 1919	F. P. Caughlin Co	Cutting, asphalt, brick gutter, new limestone curb, old curb reset, rad. curb, Woodstock Place, from W'ly line of Terrace Ave. to W'ly line of Summit Ave.	9,696.22
264	Aug. 14, 1919	John Weiher & Sons	Cutting, old cobblestone pavement remov., cement concrete, alley bet. 19th and 20th Sts., Wells and Cedar Sts.	1,201.74
265	Aug. 26, 1919	Kehrein Construction Co	Cutting, fil'ing, 8-inch cement concrete, alley bet. South Pierce, Park, Clinton and Reed Sts., 5th Ward	1,533.36
266	Aug. 9, 1919	Blodgett-Clayton Const. Co	Cutting, cement concrete, cement sidewalks, alley bet. 10th, 11th, Wright and Clarke Sts.	2,626.22
267	Aug. 9, 1919	John H. Donahue	Cutting, filling, old pavement remov., cement concrete, alley bet. Downer, Stowell Ave., Belleview Place and Park Place	1,770.48
268	Aug. 9, 1919	Blodgett-Clayton Const. Co	Cutting, old limestone pavement remov., cement concrete, alley bet. 35th, 36th, Brown and Pabst Ave.	1,490.30
269	Aug. 9, 1919	Blodgett-Clayton Const. Co	Cutting, filling, cement concrete, alley bet. 39th, 40th, Locust and Chambers Sts.	1,740.55
270	Aug. 15, 1919	Frank Banaszak	Filling, cement concrete, alley bet. 17th and 18th Aves., 200 ft. south of Scott Str., to Scott Str.	810.30
276	Sept. 8, 1919	Frank Banaszak	Cutting, old pavement removed, brick paving, alley bet. Biddle, Oneida, Milwaukee and Jefferson Sts., 3rd Ward	2,306.60
277	Sept. 8, 1919	Frank Banaszak	Cutting, old pavement removed, brick paving, alley bet. Oneida, Biddle, Broadway and Market Sts., 3rd Ward	2,322.56
278	Sept. 8, 1919	Frank Banaszak	Cutting, filling, old pavement remov., cement concrete, alley bet. Wisconsin, Mason, Marshall and Cass Sts., 3rd Ward	1,240.14
279	Sept. 12, 1919	John Weiher & Sons	Cutting, N. S. curb, curb reset, new rad. curb, brick gutter, bituminous concrete, north 120 ft. of alley bet. Mason, Oneida, Jackson and Jefferson Sts., 3rd Ward	671.51
280	Sept. 3, 1919	Frank Schomann	Cutting, filling, cement concrete, alleys, bet. 46th, 47th, North and Meinecke Aves., 22nd Ward	2,494.60

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
281	Sept. 8, 1919	Badger Construction Co	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, 22nd St., from Keefe Ave. to S. L. of Herbert St., 20th ward	4,632.26
286	Sept. 24, 1919	Milwaukee General Const. Co	Cutting, filling, old pavement removed, cement concrete, alley betw. 8th, 9th, Chestnut and Winnebago Sts., 2nd ward	2,299.75
287	Sept. 17, 1919	Ryback & Sadowski	Cutting, filling, old pavement removed, cement concrete, alley running N. and S., betw. 2nd and 3rd Aves., Lapham and Orchard Sts., 8th ward	3,251.62
288	Oct. 14, 1919	Milwaukee General Const. Co	Cutting, filling, old pavement removed, old concrete removed, new granite pavement on 8-inch concrete foundation, Canal St., from W. L. of Muskego Ave., to E. L. of 20th St., 5th and 23rd wards.	58,056.35
289	Oct. 6, 1919	John H. Donahue	Cutting, old pavement removed, granite block paving, N. S. L. curb, old S. L. curb reset, Cape St., from the North line of Ship St., to the S. L. of Walnut St., 6th ward	12,713.40
290	Sept. 23, 1919	Frank Schomann	Cement sidewalks Concordia Ave., from 27th to 30th Sts., 20th ward	1,664.64
291	Sept. 30, 1919	Badger Construction Co.	Cutting, asphalt, brick gutter, N. S. L. curb, old S. L. curb reset, Prairie St., from the W. L. of 10th St., to the E. L. of 12th St., 2nd ward	7,852.10
292	Sept. 29, 1919	Ryback & Sadowski	Cutting, filling, cement sidewalks, east side of Rosehill Place, from Becher St. to Dunlop St., 24th ward	415.94
293	Oct. 17, 1919	Retzlaff, Froemming & Bluhm	Cutting, filling, old pavement removed, new cement concrete, alley betw. 13th and 14th St., Fond du Lac Ave. and Wine St., 10th ward	2,082.92
294	Oct. 17, 1919	Retzlaff, Froemming & Bluhm	Cutting, filling, old cobblestone pavement removed, cement concrete, alley betw. 10th and 11th Sts., Wine and Sherman Sts., 10th ward	2,260.49
295	Oct. 2, 1919	Blodgett-Clayton Const. Co	Cutting, filling, cement concrete, alley betw. Washington Blvd., Vine St., 51st and 52nd Sts., 19th ward	1,917.63

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
296	Oct. 6, 1919	Dean Construction Co	Cutting, filling, hard sandstone paving, str. limestone curb, rad. L. curb, cement sidewalks, old walks removed, Washington St., from E. L. of Clinton St. to a point 230 feet east of the E. L. of Davidson St., 5th ward	32,227.86
297	Oct. 6, 1919	Blodgett-Clayton Const. Co	Cutting, filling, cement concrete, alley running east and west and the center 20 feet of alley running north and south, betw. 27th, 28th, Burleigh Sts. and Auer Ave., 20th ward	3,152.37
302	Oct. 20, 1919	Frank Banaszak	Cutting, cement concrete, alley betw. Scott, Fredrica Pl., 32nd and Trowbridge Aves., 23rd ward	872.58
309	Oct. 21, 1919	Milwaukee General Const. Co	Cutting, cement concrete, north alley betw. 21st and 22nd Sts. Cherry and Galena Sts., 9th ward	967.66
310	Oct. 21, 1919	Milwaukee General Const. Co	Cutting, cement concrete, north alley betw. 22nd and 23rd Sts., and Cherry and Galena Sts., 9th ward	1,079.34
311	Oct. 21, 1919	Milwaukee General Const. Co	Cutting, cement concrete, alley betw. 55th, 56th Sts., Pabst Ave. and Elm St., 22nd ward	2,644.26
4	Mar. 14, 1919	Croft & Dougherty	Concrete work, two cottages, Blue Mound Sanatorium	4,035.00
5	Mar. 10, 1919	C. J. Fox	Heating two cottages, Blue Mound Sanatorium	1,920.00
6	Mar. 13, 1919	W. J. Krauss	Lath and plastering two cottages, B. M. S.	1,048.00
7	Mar. 11, 1919	Edward Kirner	Carpenter work, two cottages, B. M. S.	9,240.00
8	Mar. 13, 1919	H. E. Schaetzke	Tin and galvanized iron, two cottages, B. M. S.	389.00
9	Mar. 10, 1919	Otto A. Waskow	Plumbing and sewerage work, two cottages, B. M. S.	3,098.00
47	Mar. 28, 1919	Federal Asbestos Compnay	Refrigerating work necessary for const. of a refrigerating room to be erected on premises owned by the City on Mitchell St., betw. 18th and 19th Aves	1,555.00
50	Apr. 4, 1919	Clos Construction Company	Concrete work Central Market Scale House, (except Shelter Sheds)	2,027.00
51	Apr. 14, 1919	Anton Schmitt	Mason work Central Mark Scale House, (except shelter sheds)	1,950.00
52	Apr. 14, 1919	W. J. Krauss	Lath and plastering Central Market Scale House, (except shelter sheds)	260.00

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
53	Apr. 4, 1919	John Hay	Carpenter work, Central Market Scale House, (except shelter sheds)	2,230.00
54	Apr. 5, 1919	Otto A. Waskow	Plumbing, Central Market Scale House (except shelter sheds)	1,484.00
55	Apr. 9, 1919	Wenzel & Henoch	Hot water heating, Central Market Scale House, (except shelter sheds)	897.00
56	Apr. 10, 1919	Bayley Struct. Iron Co	Cast and wrought iron work, Central Market Scale House, (except shelter sheds)	160.00
57	Apr. 16, 1919	Cream City Roof'g & Paint Mfg. Co.	Roofing, Central Market Scale House, (except shelter sheds)	49.00
58	Apr. 5, 1919	H. Neidner & Company	Tile work, Central Market Scale House, (except shelter sheds)	128.00
59	Apr. 8, 1919	Paul L. Biersach	Galvanized iron and tin work, Central Market Scale House, (except shelter sheds)	240.00
135	Apr. 30, 1919	Edw. E. Gillen Company	Construct new concrete abutment at the west end of Becher St. Swing Bridge, across Kinnickinnic river	9,344.18
274	Aug. 21, 1919	Milwaukee Bridge Company	Structural steel work for stairway at Greves St. and 27th St. Viaduct	2,100.00
275	Aug. 27, 1919	Milwaukee Scale & Supply Co	Scale and type registering beam for scale house	648.50
282	Sept. 17, 1919	Riesen Bros. Company	Concrete work, Third Unit Store House Bldg., 1st Ave. & East St.	1,990.00
283	Oct. 2, 1919	Theo. Stark & Company	Mason work, Third Unit Store House Bldg., 1st Ave. & East St.	670.00
284	Sept. 16, 1919	C. Hennecke Co	Cast iron and steel work, Third Unit Store House Bldg., 1st Ave. and East St.	227.00
285	Sept. 16, 1919	Wm. Gallun	Galvanized iron and tin work, Third Unit Store House Bldg., 1st Ave. and East St.	338.00
301	Oct. 14, 1919	Bayley Structural Iron Co	Furnish and deliver all structural steel necessary and required to repairs to Racine St. Bridge	2,225.00
303	Oct. 23, 1919	Emil Grether	Concrete work, two cottages, Blue Mound Sanatorium	4,780.00
304	Oct. 17, 1919	C. J. Fox	Furnishing all material and doing all work necessary for heating of two cottages at Blue Mound Sanatorium	1,280.00
305	Nov. 13, 1919	W. J. Krauss	Lath and plastering work for two cottages, Blue Mound Sanatorium	1,394.00
306	Oct. 17, 1919	Chas. Guetzkow	Carpenter work for two cottages at Blue Mound Sanatorium	13,952.00

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Con. No.	DATE		WORK OR MATERIAL	AMOUNT
307	Oct. 18, 1919	H. E. Schaetzke	All galvanized iron and tin work on two cottages, Blue Mound Sanatorium	434.00
308	Oct. 16, 1919	Otto A. Waskow	Plumbing and sewerage work in construction of two cottages at Blue Mound Sanatorium	3,598.00
317	Dec. 12, 1919	American Laundry Machinery Co.	Laundry equipment, Isolation Hospital	6,426.40
318	Dec. 4, 1919	A. L. Kieffer Co	Kitchen equipment, Isolation Hospital	1,384.50
319	Dec. 4, 1919	Vilter Manufacturing Co	Refrigerating equipment, Isolation Hospital	4,374.00
322	Dec. 31, 1919	Federal Cement Tile Company	New waterproof tile roof on Incinerator and two lean-to roofs	3,000.00
96	Apr. 14, 1919	Wenzel & Henoch Company	Item No. 1, per lineal foot of Tunnel, $47.50; Item No. 2, per vertical foot of man., etc., $37.00; Item No. 3, const. timber plank revetment wall, etc., $1,140.00; all to cover the construction of the Dakota St. Sewer Tunnel Extension	77,653.00
100	Apr. 25, 1919	W. T. Werner	Construct sewer in Melvina St., from 19th St. to West 19th St.	992.01
101	Apr. 25, 1919	W. T. Werner	Construct sewer in Louis Ave., from Lake St. to a point 200 feet S. of Jefferson	2,783.82
102	Apr. 25, 1919	Geo. E. Zimmermann	Sewer in Fernwood Ave., from Indiana Ave. to New York Ave.	3,341.70
144	May 14, 1919	Michael Synovitz	Sewer in Meinecke Ave., from a point 12½ feet west of 46th St. to City limits	730.25
145	May 19, 1919	Herman Hohensee	Constructing sewer in Lake St., extended, from West 19th St. to Teutonia Ave	6,615.06
146	May 13, 1919	W. T. Werner	Constructing sewer in First St., extended, from a point 118 feet south of Jefferson St. to Vienna Ave.; in Vienna Ave., from First St. to Ische Pl., and 2nd St., from Vienna Ave. to a point 260 feet south of Becker Ave.; and in Ische Pl., from Vienna Ave. to a point 365 feet south of Vienna Ave	8,657.20
147	May 15, 1919	W. T. Werner	Construct sewer in 58th St., and in Grand Circle, from Pabst Ave. to North Ave.; and in 59th St. and Grand Circle, from Pabst Ave. to North Ave	9,528.75

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Cont. No.	DATE		WORK OR MATERIAL	AMOUNT
185	June 16, 1919.....	M. Synovitz	Const. sewer in Montana St., from Howell to Quincy Ave.; in Quincy Ave., from Montana to Russell Ave.; Taylor Ave., from Montana to Russell Ave.....	6,369.75
186	June 16, 1919.....	Herman Hohensee	Const. sewer in Teutonia Ave., from Lake St. to Franklin St....	4,394.32
191	June 23, 1919.....	Herman Hohensee	Construct sewer in 11th St., from a point 145 feet south of Lake St. to Abert Pl.....	7,238.40
192	June 24, 1919.....	M. Synovitz	Sewer in Oklahoma Ave., from 10th Ave. to City limits.....	2,435.70
193	June 23, 1919.....	George E. Zimmermann	Sewer in Tenth St., from Lake to Graham.....	5,256.25
194	June 23, 1919.....	Herman Hohensee	Sewer in 12th St., from Lake St. to Abert Pl.....	4,000.00
252	Aug. 5, 1919.....	George E. Zimmermann	Sewer in Franklin St., from Liebnitz St. to Humboldt Ave....	3,186.23
253	Aug. 5, 1919.....	Herman Hohensee	Sewer in Hubbard St., from Keefe Ave., to S. L. of Riedeburg's Subd.	691.47
254	Aug. 5, 1919.....	George E. Zimmermann	Sewer in Vienna Ave., from Pt. Washington Road to 6th St.....	770.33
255	Aug. 5, 1919.....	George E. Zimmermann	Sewer in Pease St., from West 24th St. to 27th St.....	1,200.12
313	Nov. 1, 1919.....	M. Synovitz	Sewer in Hubbard St., from Keefe Ave., to R. O. W. of C. M. & St. P. Ry. Co.....	1,308.43
314	Nov. 1, 1919.....	M. Synovitz	Sewer in 21st St., from Teutonia Ave. to Franklin St.....	3,485.19
97	Apr. 10, 1919.....	Milwaukee General Const. Co.....	Cutting and sodding, grading and sodding, Kinnickinnic Ave., on each side of C. & N. W. Ry. Subway.....	1,970.65
162	May 22, 1919.....	Emil Grether	Mason work, ward yard building, S. E. cor. 8th and Chestnut St.	690.00
163	May 22, 1919.....	Wm. Bublitz	Carpenter work, Ward Yard Building, S. E. cor. 8th and Chestnut Sts.	843.00
164	May 21, 1919.....	Otto A. Waskow	Plumbing and sewerage work, Ward Yard Building, S. E. cor. 8th and Chestnut Sts.....	118.00
3	Mar. 6, 1919.....	Great Lakes Dredge & Dock Co....	Dredging several rivers and canals and removing timber revetment, removing earth, South Menomonee Canal, in the City of Milwaukee	25,000.00

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Con. No.	DATE		WORK OR MATERIAL	AMOUNT
31	Mar. 19, 1919.....	Edw. E. Gillen Company.....	Construct docks on Milwaukee River, foot of Milwaukee St., and on South Menomonee Canal, foot of South Water St.....	18,500.00
312	Nov. 7, 1919.....	Great Lakes Dredge & Dock Co....	Construct docks at foot of Johnson St. and at foot of Clinton St.	14,384.00
316	Nov. 26, 1919.....	Great Lakes Dredge & Dock Co....	Constructing 1375 lineal feet of pile and timber revetment on the west side of the Jones Island, near the mouth of the Kinnickinnic River	99,483.00
321	Dec. 13, 1919.....	Whitney Construction Company....	Piling and repairs to dock incinerator plant.....	6,600.00
99	Apr. 15, 1919.....	W. F. Cummings Company.....	Installing street lighting materials.....	176,000.00
1	Feb. 1, 1919.....	Best Block Company.....	Lease of Pu. ming Station site.....	200.00
2	Jan. 15, 1919.....	Random Lake Ice Company.....	Cutting ice on Milwaukee River.....	100.00
48	Apr. 3, 1919.....	Ryan & Ryan	Hauling and delivering water pipe.....	1,630.00
49	Mar. 29, 1919.....	Jos. B. Forrestal Company.....	Laying water mains during the year 1919.....	29,515.20
143	May 7, 1919.....	Herman Hohensee	Construction of water pipe tunnel under the Menomonee River, from West Water to Reed Sts., and a connecting water pipe line....	89,624.00
180	May 28, 1919.....	A. M. Johnson	Concession at Kilbourn Park.....	125.00
227	July 8, 1919.....	Edw. R. Kisslich.....	Concrete work for construction of Concrete Protection Railing at Kilbourn Park	1,950.00
298	Oct. 11, 1919.....	Seeboth Brothers Company.....	Purchase and remove all brass, iron and steel, from old No. 3 Compound Pumping Engine, at the North Point Pumping Sta...	2,932.18
315	Dec. 10, 1919.....	Herman Hohensee	Linwood Ave. tunnel.....	524,491.92
60	Apr. 10, 1919.....	George E. Zimmermann	House drains and water connection Hi Mound Blvd., from Elm St. to North Ave.....	796.05
61	Apr. 9, 1919.....	W. T. Werner	House drains and water connections in 55th St., from Pabst Ave. to Elm St.....	623.95
62	Apr. 22, 1919.....	Kehrein Construction Company.....	House drains and water connections in 20th Str, from Keefe Ave. to Teutonia Ave.	451.00
63	Apr. 10, 1919.....	George E. Zimmermann.....	House drains and water connections in Green Bay Ave., from Graham St., to City limits.....	4,716.60

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Con. No.	DATE		WORK OR MATERIAL	AMOUNT
98	Apr. 17, 1919.....	George E. Zimmermann.....	House drains and water connections in Clybourn St., from 25th to 27th St.....	507.50
103	May 1, 1919.....	Kehrein Construction Company.....	House drains and water connections in Bremen St., from Burleigh to Hadley Sts.....	515.00
148	May 17, 1919.....	George E. Zimmermann.....	House drains and water connections in Pease St., from West 24th to 27th St.....	49.50
149	May 17, 1919.....	George E. Zimmermann.....	House drains and water connections in Pryor Ave., from Kinnickinnic Ave. to Ellen St.....	1,681.20
150	May 12, 1919.....	F. A. Goll.....	House drains and water connections in 6th St., from Concordia Ave. to Davis St., 21st and 25th wards.....	66.70
151	May 19, 1919.....	Kehrein Construction Co.....	House drains and water connections in South Bay St., from Kinnickinnic Ave. to Lincoln Ave.....	977.34
152	May 19, 1919.....	Kehrein Construction Co.....	House drain and water connections, in Teutonia Ave., from Franklin St. to City limits; 20th St., from Franklin St., to N. L. of Lot 59, Williamsburg Add., and in 21st St., from a point 7 feet N. of N. L. of Lot 86, Blk. 2, Rosemont, to a point 10 feet N. of Lot 68, Blk. 1, Rosemont	2,723.41
153	May 19, 1919.....	Kehrein Construction Co.....	House drain and water connections in 22nd St., from Keefe Ave. to Melvina St. only.....	3,627.43
183	June 13, 1919.....	F. A. Goll.....	House drains and water connections in 18th St., from Teutonia Ave. to Davis St., 25th ward.....	330.80
184	June 13, 1919.....	F. A. Goll.....	House drains and water connections in Mason St., from Jackson St. to Juneau Pl., 3rd ward.....	76.70
195	June 30, 1919.....	George E. Zimmermann.....	House drains and water connections in Beulah Ave., from Russell Ave. to Estes St., 17th ward.....	1,207.50
196	June 30, 1919.....	F. A. Goll.....	House drains and water connection in 56th, 57th, 58th, 59th Sts. from Pabst Ave. to South City limits, 19th ward.....	967.40

LIST OF CONTRACTS AWARDED DURING 1919—Continued.

Con. No.	DATE		WORK OR MATERIAL	AMOUNT
197	June 30, 1919.....	F. A. Goll.....	House drains and water connections in First Ave., from a point 150 feet south of Maple St., to Lincoln Ave., 12th ward.....	165.40
198	June 30, 1919.....	F. A. Goll.....	House drains and water connections in Oakland Ave., from Folsom Pl. to Edgewood Ave., 18th ward.....	438.60
199	June 30, 1919	F. A. Goll.....	House drains and water connections in 6th Str., from Burleigh Str. to Concordia Ave., 21st and 25th Wards.....	278.90
225	July 10, 1919.....	George E. Zimmermann.....	House drains and water connections in North Ave., from 58th to 60th Sts., 22nd Ward	583.00
226	July 10, 1919.....	George E. Zimmermann.....	House drains and water connections in 8th Str., from Center to Burleigh Sts., 25th Ward.....	994.00
249	July 21, 1919.....	F. A. Goll.....	House drains and water connections in 8th Ave. from Forest Home Ave. to Grant Str., 8th Ward.....	413.50
250	July 23, 1919.....	George E. Zimmermann.....	House drains and water connections in 17th Str., from Center to Chambers Str., 20th Ward	788.00
251	July 26, 1919.....	Kehrein Construction Co.....	House drains and water connections in Teutonia avenue, from south line of Nash Str., to Franklin Str., 20th Ward.....	1,210.00
271	Aug. 26, 1919	Kehrein Construction Co.....	House drains and water connections in Becher Str., from Grove Str. to 2nd Ave.....	608.00
272	Aug. 15, 1919	F. A. Goll.....	House drains and water connections in West 24th Str., from Pease Str. to Franklin Str.....	1,220.00
273	Aug. 26, 1919	Kehrein Construction Co.....	House drains and water connections in 29th Str. from Concordia Ave. to Townsend Str., 20th Ward.....	104.00
299	Oct. 16, 1919.....	W. T. Werner	House drains and water connections in Middlemass Ave. from Dunlop Str., north, 24th Ward	379.00
300	Oct. 16, 1919.....	W. T. Werner.....	House drains and water connections in 17th Str. from S. L. of Mendel's Subd. to Davis Str., 25th Ward.....	510.50

January 1, 1920

List of Permanent Pavements Upon Which the Guarantee Period Commences in 1919

PERMANENT PAVEMENTS UNDER GUARANTEE.

An additional list of streets and alleys having permanent pavements, the guarantee period of same commencing during the year 1919, as follows:

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Retzlaff, Froemming & Bluhm.	Alley, Blk. 122, bet. 11th and 12th, Vliet and Cold Spring			3	Cem. Conc.	May 23, 1922
Retzlaff, Froemming & Bluhm.	Alley, Blk. 33, Hoffmann's Subd., bet. 9th and 10th Sts., Harmon and Lloyd Sts., 10th ward			3	Cem. Conc.	May 23, 1922
Blodgett, Clayton Const. Co.	Alley, Blk. 8, National Park Subd., bet. Greenfield Ave., Scott St., Layton Blvd. and 23rd Ave., 23rd ward			3	Cem. Conc.	May 27, 1922
Kroening Const. Co.	Alley, Blk. 160, bet. 7th and 8th Sts., Prairie and Chestnut Sts., 2nd ward			3	Cem. Conc.	May 15, 1922
P. C. Kroeck	Alley bet. Center and Hadley Sts., Buffum and Richards Sts., 13th ward			3	Bit. Conc.	May 27, 1922
P. C. Kroeck	Alley bet. North Pierce and Fratney Sts., Burleigh and Auer Ave., 21st ward			3	Cem. Conc.	May 27, 1922
Milwaukee Gen'l Const. Co.	Alleys, Blk. 1, Brown's Homestead Subd., betw. 16th and 17th Sts., Lloyd and Fond du Lac Ave., 10th ward			3	Cem. Conc.	June 10, 1922
R. H. Gumz	Alleys, Blk. 6, National Park Subd., betw. 24th and 25th Aves., Scott and Greenfield Ave., 23rd ward			3	Cem. Conc.	June 9, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 17, Cont. of Merrill Park, betw. 32nd and 33rd Sts., Park Hill and Canal St. 16th ward			3	Cem. Conc.	June 7, 1922
Manger & McGucken Const. Co.	Alley, Blk. 14, Kneeland's Addition, betw. 15th and 16th Sts., Vliet and Cherry Sts., 9th ward			3	Cem. Conc.	June 11, 1922
Manger & McGucken Const. Co.	Alley, Blk. 4, Grand View Park, betw. 38th and 39th Sts., Brown and Pabst Ave., 19th ward			3	Cem. Conc.	June 14, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 5, Traverse Heights, betw. 56th and 57th Sts., Pabst Ave. and Elm St., 22nd ward			3	Cem. Conc.	June 16, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 5, Hi Mount, betw. 49th and 50th Sts., Washington Blvd. and Vine St., 19th ward			3	Cem. Conc.	June 14, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Frank Schomann	Alley, Blk. 16, Cont. of Mallory and Kern's Add., betw. 31st and 32nd Sts., Lloyd and E'm Sts., 22nd ward			3	Cem. Conc.	June 14, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 2, Von Stuben Park, betw. 49th and Hi Mount Blvd., Elm St. and North Ave., 22nd ward			3	Cem. Conc.	June 16, 1922
Frank Schomann	Alley, Blk. 2, Washington Park Heights, etc., betw. 52nd and 53rd Sts., Elm and North Ave., 22nd ward			3	Cem. Conc.	June 16, 1922
Retzlaff, Froemming & Bluhm.	Alley, Blk. 18, Residence Park, betw. 41st and Grant Blvd., Center and Hadley Sts., 20th ward			3	Cem. Conc.	June 14, 1922
Kehrein Const. Co. (Assigned to Retzlaff, Froemming & Bluhm	Alley, Blk. 224, J. B. A. Kern's Subd., betw. 1st St. and Island Ave., and North Ave. and Lee Sts., 13th ward			3	Cem. Conc.	June 17, 1922
Milwaukee Gen'l Const. Co.	Alley, Blk. 13, Milwaukee Savings & Invest. Asso. No. 2, betw. 12th and Louis Ave., Burleigh and Ring Sts., 25th ward			3	Cem. Conc.	June 18, 1922
Frank Schomann	Alleys, Blk. 3, Washington Pk. Heights and Lands betw. 52nd and 53rd Sts., Pabst Ave., and Elm St., 22nd ward			3	Cem. Conc.	June 21, 1922
Manger & McGucken Const Co.	Alley, Blk. 6, Western Ave. Park, Blk. 6, Cont. of Western Ave. Park, betw. 35th and 36th Sts., Wright and Clarke Sts., 22nd ward			3	Cem. Conc.	June 23, 1922
Milwaukee General Const. Co.	North and south alley, Blk. 3, Mitchell's Subd., betw. Mitchell and Windlake, 2nd and 3rd Ave., 8th ward			3	Cem. Conc.	June 24, 1922
Milwaukee General Const. Co.	Alley, Blk. 148, Huidekoper's Sub. and Blk. 138, Judge A. D. Smith's Sub., betw. Grove and 1st Ave., Mitchell and Maple Sts., 12th ward.			3	Cem. Conc.	June 24, 1922
Milwaukee General Const. Co.	Alley, Blk. 13, Kneeland's Add., betw. 15th and 16th Sts., and Cherry and Galena Sts., 9th ward			3	Cem. Conc.	June 25, 1922
Frank Banaszak	Alley, Blk. 10, Walker's Point Add., betw. Madison and Scott Sts., 3rd and 4th Aves., 5th ward			3	Cem. Conc.	June 24, 1922
Kehrein Const. Co. (Assigned to Retzlaff, Froemming & Bluhm	Alley, Blk. 18, Vliet's Add., betw. 9th and 10th Sts., Lloyd and Garfield Ave., 10th ward			3	Cem. Conc.	June 25, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Kehrein Const. Co. (Assigned to Retzlaff, Froemming & Bluhm	Alley, Blk. 19, Vliet's Add., betw. 10th and 11th Sts., Lloyd and Garfield Ave., 10th ward			3	Cem. Conc.	June 25, 1922
Frank Schomann	Alley, Blk. 4, Von Steuben Park, betw. Hi Mount Blvd. and 51st St., Pabst Ave. and Elm St., 22nd ward			3	Cem. Conc.	July 3, 1922
Blodgett-Clayton Const Co.	Alley Blk. 8, Pub. Park Land Asso. Subd., betw. 47th and 48th Sts., Pabst Ave. and Elm St., 22nd ward			3	Cem. Conc.	July 3, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 5, Prussian Heights, betw. 34th and 35th Sts., Meinecke Ave. and Wright St., 22nd ward			3	Cem. Conc.	July 3, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 1, Milwaukee Nat'l Land Co.'s Subd., betw. 26th and 27th Sts., Chambers and Burleigh, 20th ward			3	Cem. Conc.	July 3, 1922
Retzlaff, Froemming & Bluhm.	Alley, Blk. 13, Third Cont. of Blvd. Park, betw. Grant and Sherman Blvds., Clarke and Center, 22nd ward			3	Cem. Conc.	July 3, 1922
Retzlaff, Froemming & Bluhm.	So. 254 ft. of alley, Blk. 5, Von Steuben Park, betw. 49th and Hi Mount Blvd., Pabst Ave. and Elm St., 22nd ward			3	Cem. Conc.	July 3, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 58, Re-Sub., of Blks. 53 to 60 incl. of Otis B. Hopkins Sub., etc., betw. Holton and Buffum, Hadley and Locust Sts., 21st ward.			3	Cem. Conc.	July 18, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 1, North Ave. Park, betw. 31st and 32nd Sts., North and Meinecke Aves., 22nd ward			3	Cem. Conc.	July 18, 1922
Frank Schomann	Alley, Blk. 4, Pub. Park Land Asso. Subd., betw. Sherman Blvd., and 44th St., Pabst and Lisbon Aves., 22nd ward			3	Cem. Conc.	July 21, 1922
Frank Schomann	South ½ of alley, Blk. 6, Sub. of Lot 7, Blk. 5, Lot 7, Blk. 6, Lot 24, Blk. 4, Grant Park, betw. 42nd St., Sherman Blvd., Pabst Ave. and Eiring Pl., 22nd ward			3	Cem. Conc.	July 21, 1922
Frank Schomann	Alley, Blk. 2, People's Bldg. & Loan Asso., Sub. No. 4, betw. 45th and 46th Sts., Lisbon and North Aves., 22nd ward			3	Cem. Conc.	July 21, 1922
Milwaukee General Const. Co.	Alley, Blk. 7, Walker's Point Add., betw. 1st and 2nd Aves., Madison and Greenfield Ave., 5th ward			3	Cem. Conc.	July 17, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Milwaukee General Const Co..	Alley, Blk. 10, Ludington's Subd., betw. Hadley and Locust Sts., 16th and 17th Sts., 20th ward			3	Cem. Conc....	July 16, 1922
Milwaukee General Const. Co..	Alley, Blk. 9, Hopkins and Hadley's Subd., No. 3, betw. 8th and 9th Aves., Hayes and Arthur Ave., 14th ward			3	Cem. Conc....	July 16, 1922
Milwaukee General Const. Co..	Alley, Blk. 9, Milwaukee Proper, betw. Scott and Washington Sts., Grove and 1st Ave., 5th ward			3	Cem. Conc....	July 17, 1922
Manger & McGuecken Const. Co.	Alley, Blk. 14, Walnut Hill, betw. Cherry and Galena, R. of W. C. M. & St. P. Ry., and 32nd St., 19th ward			3	Cem. Conc....	July 21, 1922
Kroening Construction Co.....	Alley, Blk. 3, Tweedy's Park Sub., and Lands N. E. ¼ Sec. No. 1, betw. 28th and 29th Aves., Greenfield and Orchard Pl., 11th ward			3	Cem. Conc....	July 22, 1922
Frank Banaszak	Alley, Blk. 11, Walker's Point, betw. Reed and Hanover, Lake and Oregon Sts., 5th ward			3	Cem. Conc....	July 21, 1922
Milwaukee Gen'l Const. Co....	N. and S. alley, Blk. 144, L. W. Week's Subd., betw. Lapham and Mitchell, and 2nd and 3rd Aves., 8th ward			3	Cem. Conc....	July 22, 1922
Blodgett-Clayton Const. Co....	Alley, Blk. 8, Moses Kneeland's Partition, betw. Humboldt, Weil, Chambers and Burleigh Sts., 21st ward			3	Cem. Conc....	July 24, 1922
Milwaukee General Const. Co..	E. and W. alleys, Blk. 144, L. W. Week's Sub., betw. Lapham and Mitchell, 2nd and 3rd Aves., 8th ward			3	Cem. Conc....	July 22, 1922
Milwaukee General Const. Co.	Alley, Blk. 10, Garfield Heights No. 2, betw. 29th and 30th Sts., Lloyd and North Ave., 22nd ward			3	Cem. Conc....	July 22, 1922
Ryback & Sadowski.....	Alley, Blk. 3, Guderts & Steinmueller Sub., Blk. 14, Trowbridge Park, and lands in S. E. ¼ Sec. 6, betw. Burnham and Rogers, 24th and 25th Aves., 11th ward			3	Cem. Conc....	July 25, 1922
Kroening Const. Co.....	Alley, Blk. 20, Henry Mann's Subd., betw. Lenox and Logan Aves., Dakota and Montana Sts., 17th ward			3	Cem. Conc....	July 24, 1922
Milwaukee General Const. Co..	Alleys, Blk. 14, Rice Subd., betw. West 24th and 25th Sts., Center and Hadley Sts., 20th ward			3	Cem. Conc....	July 25, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET FROM TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Kroening Const. Co.	Alley, Blk. 4, G. A. Richards Add., betw. Hadley and Locust Sts., Island Ave. and 1st St., 21st ward	3	Cem. Conc.	July 24, 1922
Frank Banaszak	Alley, Blk. 10, Hopkins and Hadley's Subd. No. 3, betw. 8th and 9th Aves., Arthur and Harrison Aves., 14th ward	3	Cem. Conc.	July 31, 1922
Kroening Const. Co.	Alley, Blk. 17, Vliet's Add., betw. 9th and 10th Sts., Garfield and North Aves., 10th ward	3	Cem. Conc.	July 28, 1922
Kroening Const. Co.	Alley, Blk. 9, Walker's Point, betw. Lake and Oregon Sts., Barclay and Clinton Sts., 5th ward	3	Cem. Conc.	July 30, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 17, Residence Park, betw. Grant and Sherman Blvd., Center and Hadley Sts., 20th ward	3	Cem. Conc.	July 31, 1922
Frank Banaszak	Alley, Blk. 8, Hopkins and Hadley's Subd. No. 3, betw. Hayes and Arthur Aves., 9th and 10th Aves., 14th ward	3	Cem. Conc.	July 30, 1922
Blodgett Clayton Const. Co.	Alley, Blk. 3, Thornridge, betw. 31st and 32nd Sts., Clybourn and Sycamore Sts., 16th ward	3	Cem. Conc.	Aug. 2, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 6, First Cont. of Thornridge, betw. 33rd and 34th Sts., Clybourn and Sycamore Sts., 16th ward	3	Cem. Conc.	Aug. 2, 1922
Milwaukee General Const. Co.	Alley, Blk. 2, Cawker's Subd. B, betw. West 24th and 25th Sts., Chambers and Burleigh Sts., 20th ward	3	Cem. Conc.	July 30, 1922
Frank Schomann	Alley, Blk. 11, 2nd Cont. of Jackson Park, betw. 45th and 46th Sts., Clarke and Center Sts., 22nd ward	3	Cem. Conc.	Aug. 1, 1922
Frank Schomann	Alley, Blk. 4, Lewis' Subd., and Blk. 6, Prussian Heights, betw. 33rd and 34th Sts., Meinecke Ave., and Wright Sts., 22nd ward	3	Cem. Conc.	Aug. 1, 1922
Retzlaff, Froemming & Bluhm.	Alley, Blk. 1, Bannen's Subd., No. 1, etc., betw. Buffum and Richard Sts., Concordia Ave. and George Sts., 21st ward	3	Cem. Conc.	Aug. 1, 1922
Milwaukee General Const. Co.	Alley, Blk. 7, 2nd Cont. of Thornridge, betw. 34th and 35th Sts., Clybourn and Sycamore Sts., 16th ward	3	Cem. Conc.	Aug. 1, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Froemming Brothers	Alley, Blk. 1, W. P. McLaren Subd., etc., betw. North Pierce and Booth Sts., Burleigh and Auer Aves., 21st ward			3	Cem. Conc.	Aug. 1, 1922
John Weiher & Sons	Alley, Blk. 22, Wells Add., betw. 18th and 19th Sts., Wells and Cedar Sts., 4th ward			3	Bit. Conc.	Aug. 7, 1922
Frank Schomann	Alley, Blk. 1, Prussian Heights, betw. 34th and 35th Sts., Clarke and Center Sts., 22nd ward			3	Cem. Conc.	Aug. 9, 1922
Retzlaff, Froemming & Bluhm	Alleys, Blk. 1, Western Ave. Park, betw. 35th and 36th Sts., Clarke and Center Sts., 22nd ward			3	Cem. Conc.	Aug. 9, 1922
Retzlaff, Froemming & Bluhm	Alley, Blk. 4, Washington Park Heights, betw. 51st and 52nd Sts., Pabst Ave. and Elm. St., 22nd ward			3	Cem. Conc.	Aug. 9, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 21, Residence Park, betw. 39th and 40th Sts., Hadley and Locust Sts., 20th ward			3	Cem. Conc.	Aug. 14, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 22, Residence Park, betw. 40th and 41st Sts., Hadley and Locust Sts., 20th ward			3	Cem. Conc.	Aug. 14, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 35, Residence Park No. 2, betw. 36th and 37th Sts., Hadley and Locust Sts., 20th ward			3	Cem. Conc.	Aug. 14, 1922
Frank Banaszak	Alley, Blk. 1, Mitchell's Subd., of S. 44.54 acres, etc., betw. 1st and 2nd Aves., Mitchell and Maple Sts., 12th ward			3	Cem. Conc.	Aug. 7, 1922
Kroening Const. Co.	Alley, Blk. 1, Brown's Homestead, betw. 16th and 17th Sts., Fond du Lac and Lloyd St., 10th ward			3	Cem. Conc.	Aug. 19, 1922
Retzlaff, Froemming & Bluhm	Alley, Blk. 14, B. K. Miller's Subd., betw. 23rd and 24th Sts., Vliet and Cherry Sts., 9th ward			3	Cem. Conc.	July 24, 1922
Kehrein Const. Co. (Assigned to Retzlaff, Froemming & Bluhm	Alley, Blk. 7, Kneeland's Add., betw. 14th and 15th Sts., Galena and Walnut Sts., 9th ward			3	Cem. Conc.	July 24, 1922
Kehrein Const. Co. (Assigned to Retzlaff, Froemming & Bluhm	Alley, Blk. 13, Plankinton's Add., betw. 19th and 20th Sts., Vliet and Cherry Sts., 9th ward			3	Cem. Conc.	July 24, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Froemming Brothers	Alley, Blk. 3, W. P. McLaren's Subd. No. 2, etc., betw. Holton and Booth, Auer and Concordia Aves., 21st ward			3	Cem. Conc.	Aug. 21, 1922
John Weiher & Son	Alley, Blk. 1, Washington Park Heights, betw. 51st and 52nd Sts., Elm and North Ave., 22nd ward			3	Cem. Conc.	Aug. 25, 1922
Frank Schomann	Alley, Blk. 3, Jackson Park, and Blk. 3, Markham Add., betw. 45th and 46th Sts., Meinecke Ave. and Wright St., in the 22nd ward			3	Cem. Conc.	Aug. 25, 1922
Froemming Brothers	Alley, Blk. 1, Webster Ave. Heights, betw. North Pierce and Booth Sts., George and Keefe Ave., 21st ward			3	Cem. Conc.	Aug. 23, 1922
Froemming Brothers	Alley, Blk. 3, Cream City Heights, etc., betw. Holton and Buffum, Concordia and George, 21st ward			3	Cem. Conc.	Aug. 23, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 4, Mann, Burke & Somer's Subd., betw. 23rd and 24th Sts., Clarke and Center Sts., 7th ward			3	Cem. Conc.	Aug. 25, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 5, Warner Brothers & Wamboldt Subd. No. 2, and Blk. 15, 2nd Cont. of Grand View, betw. 28th and 29th Sts., Burleigh and Auer Ave., 20th ward			3	Cem. Conc.	Aug. 28, 1922
Frank Schomann	Alley, Blk. 4, Keystone, betw. 45th and 46th Sts., North and Meinecke Aves., 22nd ward			3	Cem. Conc.	Aug. 29, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 36, Residence Park No. 2, betw. 36th and 37th Sts., Center and Hadley Sts., 20th ward			3	Cem. Conc.	Aug. 28, 1922
Froemming Brothers	Alley, Blk. 1, J. C. Stacey's Subd., etc., betw. Richards St., Island Ave., Chambers and Burleigh Sts., 21st ward			3	Cem. Conc.	Aug. 29, 1922
Frank Banaszak	Alley, Blk. 20, Walker's Point, Hanover and Greenbush, Virginia and Florida Sts., 5th ward			3	Cem. Conc.	Aug. 21, 1922
Ryback & Sadowski	Alley, Blk. 3, Trowbridge Park, bet. 24th and 25th Aves., Lincoln and Grant St., 24th ward			3	Cem. Conc.	Aug. 21, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Cont. of Meinecke Subd., bet. 17th and 18th Sts., North and Meinecke Aves., 7th ward			3	Cem. Conc.	Sept. 4, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Kroening Construction Co.	Alley, Blk. 3, Western Ave. Park, bet. 37th and 38th Sts., Clarke and Center Sts., 22nd ward			3	Cem. Conc.	Sept. 3, 1922
Frank Banaszak	Alley, Blk. 3, Assessment Subd. No. 43, etc., bet. Burnham and Rogers Sts., 5th and 6th Aves., 8th Ward			3	Cem. Conc.	Sept. 6, 1922
John Weiher & Sons	Alley, Blk. 21, Wells' Addition, bet. Wells and Cedar, 19th and 20th Sts., 4th ward			3	Cem. Conc.	Sept. 4, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 6, Subd. of a part of W. 60.50 acres, bet. 10th and 11th Sts., Wright and Clarke Sts., 7th ward			3	Cem. Conc.	Sept. 8, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 4, National Ave. Heights, and Blk. 1, Tweedy's Subd., bet. Scott and Madison Sts., 26th and 27th Aves., 23rd ward			3	Cem. Conc.	Sept. 8, 1922
Frank Schomann	Alley, Blk. 4, Western Ave. Park, bet. 37th and 38th Sts., Wright and Clarke Sts., 22nd Ward			3	Cem. Conc.	Sept. 9, 1922
Froemming Brothers	Alley, J. Schoknecht's Sub., and Fred Loenin's Subd., bet. Buffum and Richards, Burleigh and Auer Ave., 21st Ward			3	Cem. Conc.	Sept. 8, 1922
Frank Schomann	Alley, Blk. 1, Sherman Park, bet. 37th and 38th Sts., Meinecke and Wright Sts., 22nd ward			3	Cem. Conc.	Sept. 9, 1922
Milwaukee General Const. Co.	Alley, Blk. 27, Henry Mann's Subd., bet. Idaho and Manitoba, Herman and Logan Aves., 17th ward			3	Cem. Conc.	Sept. 8, 1922
Frank Schomann	Alley, Blk. 2, Steger's Subd. and Lands, bet. 36th and 37th Sts., North and Meinecke Aves., 22nd ward			3	Cem. Conc.	Sept. 10, 1922
Ryback & Sadowski	No. 240 ft. alley, Blk. 6, Trowbridge Park Cont., bet. 24th and 25th Aves., Grant and Becher Sts., 24th ward			3	Cem. Conc.	Sept. 5, 1922
Ryback & Sadowski	East and west alley, Blk. 2, Lincoln Ave. Heights, bet. 3rd and 4th Aves., Lincoln and Hayes Aves., 14th ward			3	Cem. Conc.	Sept. 13, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 29, Residence Park No. 2, bet. 36th and 37th Sts., Locust and Chambers Sts., 20th ward			3	Cem. Conc.	Sept. 10, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 28, Residence Park No. 2, bet. 36th and 37th Sts., Chambers and Burleigh Sts., 20th ward			3	Cem. Conc.	Sept. 10, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Frank Banaszak	Alley, Blk. 7, Fred Gipp, Subd. of Blk. 7 and 8, Sunnyside, and a part of east ½ of southwest ¼ Sec. 8, bet. 3rd and 4th Aves., Dakota and Manitoba Sts., 14th ward			3	Cem. Conc	Sept. 15, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 1, Grand View Park, bet. 35th and 36th Sts., Pabst Ave. and Brown St., 19th ward			3	Cem. Conc.	Sept. 19, 1922
Ryback & Sadowski	Alley, Blk. 5, National Park Subd., between 25th and 26th Aves., Scott and Greenfield Ave., 23rd ward			3	Cem. Conc.	Sept. 22, 1922
Milwaukee General Const. Co.	Alley, Blk. 5, J. Williams Subd., bet. Kinnickinnic Ave. and Linus St., Conway & Woodward Aves., 17th ward			3	Cem. Conc.	Sept. 16, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 1, Perrigo Park Subd., bet. 39th and 40th Sts., Chambers and Burleigh Sts., 20th ward			3	Cem. Conc.	Sept. 24, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 4, Perrigo Park Subd., bet. 39th and 40th Sts., Locust and Chambers Sts., 20th ward			3	Cem. Conc.	Sept. 24, 1922
Frank Schomann	Alley, Blk. 1, Steger's Subd., bet. 35th and 36th Sts., North and Meinecke Aves., 22nd ward			3	Cem. Conc.	Sept. 24, 1922
Frank Banaszak	Alley, Blk. 39, Clarke's Addition, bet. 17th and 18th Aves., 200 ft. south of Scott St. to Scott St., 23rd ward			3	Cem. Conc.	Sept. 23, 1922
Kehrein Const. Co.	North alley, Blk. 7, Wells' Add., bet. 17th and 18th Sts., Chestnut and Cold Spring Ave., 2nd ward			3	Cem. Conc.	Sept. 15, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 2, Miniature Addition No. 1, bet. 34th and 35th Sts., Hadley and Locust Sts., 20th ward			3	Cem. Conc.	Sept. 29, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 1, Miniature Addition No. 1, bet. 33rd and 34th Sts., Hadley and Locust Sts., 20th ward			3	Cem. Conc.	Sept. 29, 1922
John Weiher & Sons	North 120 ft. of alley, Blk. 21, bet. Mason and Oneida Sts., Jackson and Jefferson Sts., 3rd ward			3	Bit. Conc.	Sept. 29, 1922
Frank Banaszak	Alley, Blk. 97, bet. Marshall and Mason Sts., and Wisconsin and Cass Sts., 3rd ward			3	Cem. Conc.	Oct. 3, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
Kehrein Const. Co.	Alley, Blk. 1, Hanauer's Subd., etc., bet. 15th and 16th Sts., Meinecke Ave. and Wright St., 7th ward			3	Cem. Conc.	Sept. 30, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 2, Zingen & Braun and Blk. 2, Forster Sub., bet. 35th and 36th Sts., Locust and Chambers Sts., 20th ward			3	Cem. Conc.	Oct. 9, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Zingen & Braun, 2nd Subd., and Blk. 3, Forster Subd. bet. 35th and 36th Sts., Hadley and Locust Sts., 20th ward			3	Cem. Conc.	Oct. 9, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Fond du Lac Ave. Heights, bet. 34th and 35th, Burleigh and Auer Ave., 20th ward			3	Cem. Conc.	Oct. 13, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 1, Forster Subd., and Blk. 1, Zingen & Braun's 2nd Subd., bet. 35th and 36th Sts., Chambers and Burleigh Sts., 20th ward			3	Cem. Conc.	Oct. 13, 1922
Kehrein Const. Co.	Alley, Blk. 28, Walker's Point, bet. South Pierce and Park Sts., Clinton and Reed Sts., 5th ward			3	Cem. Conc.	Oct. 18, 1922
John H. Donahue	Alley, Blk. 1, Milwaukee Savings & Invest. Asso. Subd. No. 3, bet. Downer and Stowell Ave., Belleview and Park Place, 18th ward			3	Cem. Conc.	Oct. 25, 1922
Frank Schomann	Alley, Blk. 8, parts of Blks. 4, 5, and 6, and all of Blks 7, 8, and 9, being part of Germania Park, S. E. ¼ Sec. 13, bet 28th and 29th Sts., Meinecke and Wright Sts., 22nd ward			3	Cem. Conc.	Oct. 29, 1922
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Cont. of Hi. Mount, bet. 51st and 52nd Sts., Vine and Washington Blvd., 19th ward			3	Cem. Conc.	Oct. 28, 1922
Frank Schomann	Alley, Blk. 3, Keystone Subd., bet. 46th and 47th Sts., North and Meinecke Aves., 22nd ward			3	Cem. Conc.	Oct. 30, 1922
Frank Banaszak	Alley, Blk. 62, bet. Oneida and Biddle Sts., Broadway and Market St., 3rd ward			5	Brick	Nov. 8, 1924
Frank Banaszak	Alley, Blk. 70., bet. Biddle and Oneida, Milwaukee and Jefferson Sts., 3rd ward			5	Brick	Nov. 8, 1924
Milwaukee General Const. Co.	Alleys, Blk. 128, bet. 8th and 9th Sts., Chestnut and Winnebago Sts., 2nd ward			3	Cem. Conc.	Oct. 31, 1922

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Guarantee Expiration
Ryback & Sadowski	Alley, Blk. 133, L. W. Week's Subd., bet. 2nd and 3rd Aves., Orchard and Lapham Sts., 8th ward			3	Cem. Conc.	Oct. 23, 1922
Milwaukee General Const. Co.	Alley, Blk. 10, Dickermann's Subd., bet. 22nd and 23rd Sts., Cherry and Galena Sts., 9th ward			3	Cem. Conc.	Nov. 15, 1922
Milwaukee General Const. Co.	Alley, Blk. 6, Miner Addition, and Blk. 6, Dickermann's Subd., bet. 21st and 22nd Sts., Cherry and Galena Sts., 9th ward			3	Cem. Conc.	Nov. 15, 1922
Badger Const. Co. (Assigned to White Construction Co.)	American Ave.	Oklahoma Ave.	Manitoba St.	5	Asphalt	June 25, 1924
White Construction Co.	Becher	26th Ave.	27th Ave.	5	Asphalt	July 14, 1924
White Construction Co.	Becher	Windlake Ave.	11th Ave.	5	Asphalt	July 15, 1924
F. P. Caughlin Co.	Bremen	Hadley	Burleigh	5	Asphalt	Aug. 21, 1924
Badger Construction Co.	Becher	Grove	2nd Ave.	5	Asphalt	Sept. 13, 1924
Badger Construction Co.	Beulah Ave.	Russell	Estes	5	Asphalt	Sept. 23, 1924
F. P. Caughlin Co.	Biddle	Cass	Astor	5	Asphalt	Sept. 29, 1924
Badger Construction Co.	Cass	Knapp	Ogden Ave.	5	Asphalt	June 7, 1924
Manger & McGucken Const. Co.	Clybourn	25th	27th	5	Brick	Aug. 9, 1924
Badger Construction Co.	Cherry	10th	11th	5	Asphalt	Sept. 4, 1924
Badger Construction Co.	18th St.	Wells	Cedar	5	Asphalt	July 2, 1924
White Construction Co.	18th Ave.	Rogers	Merrill	5	Asphalt	July 14, 1924
F. P. Caughlin Co.	8th St.	Abert Heights	Abert Place	5	Asphalt	Nov. 7, 1924
Badger Construction Co.	8th St.	North Ave.	Center	5	Asphalt	Nov. 10, 1924
Badger Construction Co.	8th St.	Center	Burleigh	5	Asphalt	Nov. 8, 1924
F. P. Caughlin Co.	18th St.	Teutonia Ave.	Davis	5	Asphalt	Nov. 17, 1924
Badger Construction Co.	15th St.	N. L. of State	S. L. of Vliet	5	Asphalt	June 16, 1924
White Construction Co.	5th Ave.	Dakota	Montana	5	Asphalt	June 25, 1924
White Construction Co.	Florida	Reed	Grove	5	Asphalt	July 19, 1924
Badger Construction Co.	55th	Elm St.	North Ave.	5	Asphalt	July 28, 1924

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Guarantee Expiration
Badger Construction Co.	55th	Pabst Ave.	Elm	5	Asphalt	July 28, 1924
White Construction Co.	14th St.	Cedar	Vliet	5	Asphalt	July 30, 1924
Badger Construction Co.	41st St.	Locust	Burleigh	5	Asphalt	Aug. 2, 1924
Badger Construction Co.	51st St.	Elm	North Ave.	5	Asphalt	Aug. 8, 1924
Badger Construction Co.	57th St.	Pabst Ave.	North Ave.	5	Asphalt	Aug. 29, 1924
Badger Construction Co.	56th	Pabst Ave.	North Ave.	5	Asphalt	Sept. 2, 1924
White Construction Co. (Assigned to Badger Const. Co.	56th, 57th, 58th 59th St.	Pabst Ave.	City Limits	5	Asphalt	Oct. 30, 1924
F. P. Caughlin Co.	Franklin Pl.	Ogden Ave.	110 ft. N. of Lyon	5	Asphalt	Nov. 12, 1924
White Construction Co.	Grant St.	26th Ave.	27th Ave.	5	Asphalt	July 14, 1924
Wisconsin Construction Co.	Graham St.	Atkinson Ave.	Green Bay Ave.	3	Bit. Conc.	July 17, 1922
F. P. Caughlin Co.	Green Bay Ave.	Graham	City Limits	5	Asphalt	Nov. 7, 1924
Badger Construction Co.	Hi Mount Blvd.	Elm	North Ave.	5	Asphalt	Aug. 2, 1924
White Construction Co.	Howell Ave.	Oklahoma Ave.	Dover Pl.	5	Asphalt	Aug. 22, 1924
John Weiher & Sons	Lawton Place	Harmon	Garfield Ave.	3	Bit. Conc.	Aug. 7, 1922
F. P. Caughlin Co.	Lawton Place	Reservoir Ave.	Harmon St.	5	Asphalt	Aug. 29, 1924
White Construction Co.	Manitoba	8th Ave.	American Ave.	5	Asphalt	June 18, 1924
Retzlaff, Froemming & Bluhm	McKinley Blvd.	34th	35th	3	Cem. Sidewalks	July 21, 1922
Badger Construction Co.	Meinecke Ave.	45th St.	to a pt. 120 ft. west of 46th St.	5	Asphalt	July 28, 1924
F. P. Caughlin Co.	Maryland Ave.	Kenwood Blvd.	Hartford Ave.	5	Asphalt	Aug. 26, 1924
Badger Construction Co.	19th St.	Grand Ave.	Cedar	5	Asphalt	July 2, 1924
Badger Construction Co.	North Ave.	53rd St.	60th St.	5	Asphalt	Oct. 14, 1924
F. P. Caughlin Co.	Ninth St.	Somer's Sub. No. 1	Lot 17, Blk. 4, Washington Pk. No. 2	5	Asphalt	Nov. 7, 1924
White Construction Co.	Pryor Ave.	Kinnickinnic Ave.	Ellen St.	5	Asphalt	Sept. 4, 1924
Badger Construction Co.	Pabst Ave.	Sherman Blvd.	50th St.	5	Asphalt	Sept. 10, 1924

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years.	Kind Material	Expiration Guarantee
White Construction Co. (Assigned to Badger Const. Co..	Pabst Ave.	56th St.	Spring Ave.	5	Asphalt	Oct. 30, 1924
Wisconsin Const. Co	Rogers St.	26th Ave.	27th Ave.	3	Bit. Conc	June 10, 1922
F. P. Caughlin Co	Sixth St.	Concordia Ave	Davis	5	Asphalt	Aug. 26, 1924
F. P. Caughlin Co	Sixth St.	Burleigh	Concordia Ave.	5	Asphalt	Aug. 26, 1924
F. P. Caughlin Co	Shepard Ave.	Kenwood Blvd.	Hartford Ave.	5	Asphalt	Oct. 18, 1924
Badger Construction Co	13th St.	Vliet	Cherry	5	Asphalt	June 10, 1924
Badger Construction Co	13th St.	Cedar	Vliet	5	Asphalt	July 2, 1924
White Construction Co	3rd Ave.	Dakota	Montana	5	Asphalt	July 15, 1924
Badger Construction Co	23rd St.	Lisbon Ave.	Walnut	5	Asphalt	Sept. 4, 1924
Badger Construction Co	21st St.	Keefe Ave.	Pease	5	Asphalt	Sept. 4, 1924
Badger Construction Co	22nd St.	Keefe Ave.	Herbert	5	Asphalt	Oct. 31, 1924
Badger Construction Co	27th St.	Cedar	Vliet	5	Asphalt	July 18, 1924
White Construction Co	Vliet St.	32nd St.	35th St.	5	Asphalt	Aug. 12, 1924
Badger Construction Co	Woodstock Pl.	Prospect Ave.	Summit Ave.	5	Asphalt	June 7, 1924
F. P. Caughlin Co	Warren Ave.	Franklin Pl.	Easterly	5	Asphalt	Nov. 12, 1924
F. P. Caughlin Co	Woodstock Pl.	Terrace Ave.	Summit Ave.	5	Asphalt	Nov. 11, 1924

PERMITS ISSUED DURING THE YEAR ENDING DECEMBER 31, 1919.

1919	Excavations in Streets and Alleys		Deposit Building Material		House Drains		Storm Drains		Number of Extensions	Number of House Moving	Number of Miscellaneous
	No.	Amount	No.	Amount	No.	Amount	No.	Amount			
January	60	$ 60.00	18	$ 22.00	6	15.00	1	3.00	45	..	42
February	63	65.00	22	28.00	14	90.00	..	.....	107	1	46
March	104	124.00	103	112.00	31	140.00	..	.....	200	2	114
April	205	310.00	256	270.00	154	658.00	27	81.00	240	2	222
May	273	428.00	357	384.00	170	718.00	54	162.00	331	11	222
June	200	284.00	249	289.00	119	331.00	23	9.00	278	7	266
July	231	358.00	272	327.00	200	1,424.00	8	3.00	283	8	243
August	259	442.00	250	291.00	260	918.00	34	90.00	245	9	208
September	193	268.00	210	269.00	155	607.00	48	144.00	239	10	215
October	218	303.00	223	332.00	208	971.00	59	21.00	255	9	259
November	175	222.00	137	233.00	133	503.00	4	12.00	166	7	173
December	36	39.00	66	174.00	18	53.00	..	.....	116	2	90
	2017	$2,903.00	2163	$2,731.00	1468	$6,428.00	258	$525.00	2505	68	2100

Paid Permits Issued	5,906
Free Permits Issued	4,673
Total	10,579

Received for Excavating Permits	$2,903.00
Received for Deposit Bldg. Material Permits	2,731.00
Received for House Drain Permits	6,428.00
Received for Storm Drain Permits	525.00
Total	$12,587.00

Report

Assessment Department

Department of

Public Works, 1920

COMPARATIVE STATEMENT

For What Purpose	Amount
To special assessments levied by the Department of Public Works for the year 1918	$723,793.58
Total special assessments levied by the Department of Public Works for the year 1919	988,760.15

GRAND RECAPITULATION

of special assessments for street and alley improvements, of street improvement bonds, of special assessments and water pipe assessments by the Department of Public Works.

For What Purpose	Amount
Street improvement installments for 1919	$137,070.11
Street improvement installments prior to 1919	366,796.80
Special assessments for sewers	26,047.35
Special assessments for opening streets and alleys	125,751.29
Special assessments for vacating streets and alleys	3,376.58
Special assessments for laying water pipe	12,038.62
Special assessments for laying house drains and water connections	23,326.27
Special assessments for laying cement sidewalks	20,369.96
Special assessments for oiling streets	223,552.12
Special assessments for removing earth from sidewalks	554.75
Special assessments for cutting noxious weeds	6,228.31
Special assessments for removing snow from sidewalks	13,014.43
Special assessments for miscellaneous work	30,633.56
Total	$988,760.15

RECAPITULATION

of asessments levied by the Department of Public Works for stree and alley improvements during the year 1919.

	Total Cost of 1919 Assessable work	Installment for 1919
First	$ 20,092.52	$ 3,348.79
Second	69,137.25	11,523.04
Third	19,013.72	3,169.00
Fourth	20,777.65	3,463.88
Fifth	17,087.15	2,848.04
Sixth	18,060.52	3,010.12
Seventh	29,841.20	4,973.77
Eighth	22,386.19	3,731.32
Ninth	19,664.42	3,277.56
Tenth	8,605.66	1,439.49
Eleventh	5,787.60	964.64
Twelfth	30,487.89	5,081.41
Thirteenth	5,375.22	895.93
Fourteenth	37,821.89	8,130.06
Fifteenth	11,119.84	2,994.77
Sixteenth	12,665.00	2,110.90
Seventeenth	52,148.82	9,259.29
Eighteenth	8,208.06	1,368.10
Nineteenth	21,108.56	3,571.59
Twentieth	58,115.54	10,465.94
Twenty-first	78,025.99	13,004.74
Twenty-second	140,999.03	23,633.65
Twenty-third	10,379.44	1,731.19
Twenty-fourth	9,174.23	1,874.16
Twenty-fifth	67,186.33	11,198.01
Total Amounts	$793,269.72	$137.070.11

RECAPITULATION

of assessments levied by the Department of Public Works for the construction of main sewers during the year 1919.

No. of Assessments	Amount
767	$26,047.35

OPENING AND EXTENSION OF STREETS AND ALLEYS

The damages awarded for the property proposed to be taken in the several proceedings were $269,782.62, of which amount the sum of $125,751.29 was assessed as benefits to surrounding property and $144,031.33 was chargeable to Street and Alley Opening Fund.

The benefits assessed for the property proposed to be vacated n the several proceedings were $3,460.58, of which amount the sum)f $84.00 was awarded as damages and $3,376.58 was assessed as)enefits to surrounding property.

The damages awarded for property proposed to be taken for :he Extension of Bay View High School Site in the Seventeenth Ward were $26,469.00.

The damages awarded for property proposed to be taken for widening and extending the Ninth Street School Grounds in the Tenth Ward were $63,660.00.

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR OPENING STREETS AND ALLEYS

Ward	STREET	FROM	TO	Damages awarded for property taken	Benefits assessed against property	Amount chargeable to Street and Alley Fund
3rd	Marshall Street	Wisconsin Street	Lake Street	$164,538.64	$ 75,878.80	$ 88,659.84
25th	Seventeenth Street	Davis Street	Concordia Avenue	1,645.00	1,452.41	192.59
25th	Ninth Street	Abert Place	Green Bay Avenue	295.00	213.75	81.25
19th	Fifty-third Street	Vine Street	Pabst Avenue	1,135.00	754.56	380.44
21st	Fifth Street	Keefe Avenue	Jefferson Street	3,768.12	3,768.12	
21st	Fourth Street	Keefe Avenue	Vienna Avenue	1,133.01	1,133.01	
25th	Louis Avenue	Melvina Street	Lake Street	1,746.64	1,440.20	306.44
21st	Vienna Avenue	Fourth Street	Port Washington Avenue	895.00		895.00
21st	Seventh Street	Lake Street	Green Bay Avenue	13,177.26	4,434.72	8,742.54
21st	Alley, between Mill and Jefferson Streets and between Port Washington Avenue and Sixth Street			6,787.74	548.26	7,336.00
21st	Alley, between Mill and Jefferson Streets and between Sixth and Seventh Streets			635.00	513.54	121.46
21st	Alley running North and South from Keefe Avenue to Jefferson Street, between Fourth and Fifth Streets			1,305.54	1,183.79	121.75
21st	North and South alley, between Fifth Street and Port Washington Avenue and between Keefe Avenue and Jefferson Street			3,770.53	1,202.72	2,567.81
25th	Sixteenth Street	Nash Street	Lake Street	5,861.40	5,861.40	
21st	Becker Avenue	Second Street	Third Street	3,465.04	717.00	2,748.04
21st	Humboldt Avenue	Keefe Avenue	Lake Street	4,703.00	4,400.00	303.00
21st	Ische Place	Vienna Avenue	Keefe Avenue	4,054.45	3,707.73	346.72
25th	Abert Place	Twelfth Street	Louis Avneue	7,650.00	383.50	7,266.50
21st	Jefferson Street	Port Washington Avenue	Seventh Street	3,047.66	290.00	2,757.66
20th	Alley running North and South, from Locust Street to Fond du Lac Avenue, between 29th and 30th Streets			$85.00	637.85	247.15

LIST OF THE SEVERAL ASSESSMENTS FOR OPENING STREETS AND ALLEYS.—Continued.

Ward	STREET	FROM	TO	Damages awarded for property taken	Benefits assessed against property	Amount chargeable to Street and Alley Fund
21st	Eighth Street	Green Bay Avenue	Lake Street	7,512.00	1,328.37	6,183.63
21st	Third Street	Mill Street	Lake Street	5,060.00	388.80	4,671.20
25th	Franklin Street	Sixteenth Street	Nineteenth Street	4,789.94	500.00	4,289.94
25th	Seventeenth Street	Nash Street	Lake Street	10,845.13	5,426.12	5,419.01
25th	Eighteenth Street	Nash Street	Lake Street	10,528.26	9,586.64	941.62
			TOTALS	$269,782.62	$125,751.29	$144,031.33

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR VACATING STREETS AND ALLEYS

Ward	STREET	FROM	TO	Benefits assessed against property	Damages awarded	Excess of benefits
9th	Alley, between Lots 19 and 20, in Block 106, between Galena Street and Central Avenue and between 9th and 10th Streets					
12th	Allen Street	East line of Allis Subdivision	Allis Street	$ 500.00		$ 500.00
5th	Davidson Street	Florida Street	So. Pierce Street	200.00		200.00
	Virginia Street	Davidson Street	So. Water Street.			
	So. Pierce Street	Davidson Street	So. Water Street	2,207.00	$ 7.00	2,200.00
11th	Alleys in Block 1, in H. G. Comstock's Subdivision, between Mitchell and Burnham Streets and between 24th and 25th Avenues			253.00	39.00	214.00
19th	Alley, between 39th and 40th Streets and between Lisbon Avenue and Roberts Street			84.50		84.50
20th	28th Street	Townsend Street	North City Limits			
	Keefe Avenue	27th Street	28th Street			
	All alleys in Block 12, Continuation of Grand View			32.00	32.00	
5th	North and South alley in Block 14, between Greenbush and Grove Streets, North of Florida St.			178.08		178.08
17th	Alley running Northerly and Southerly between Northwestern and Rusk Avenues and between Ellen Street and East line of Right of Way of the Chicago and Northwestern Railway Co.			6.00	6.00	
			TOTAL	$3,460.58	$84.00	$3,376.58

Ward
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
*

STATEMENT OF SPECIAL ASSESSMENTS LEVIED DURING THE YEAR ENDING DECEMBER 31, 1919

Ward	Sewers	House drains and water connections	Water pipe	Repairing and constructing cement sidewalks	Oiling streets	Removing earth from sidewalks	Cutting noxious weeds	Removing snow from sidewalks	Opening streets and alleys	Vacating streets and alleys	Miscellaneous	Grand Total	Ward
1	.....	.....	.....	$ 561.86	$ 11,367.36	.....	$ 144.50	$ 593.80	.....	.....	$ 120.30	$ 12,787.82	1
2	.....	.....	.....	652.84	940.61	.....	.....	210.00	.....	.....	168.81	1,972.26	2
3	.....	$76.70	.....	28.65	267.17	.....	43.06	885.13	$ 75,878.80	.....	72.98	77,252.55	3
4	.....	.....	.....	717.07	3,858.95	.....	32.76	137.76	.....	.....	139.98	4,877.52	4
5	.....	.....	.....	.....	7,102.98	.....	21.42	219.75	.....	$2,378.08	104.31	9,826.54	5
6	.....	.....	.....	183.89	13,393.32	$ 13.72	44.74	102.00	.....	.....	128.83	13,866.50	6
7	.....	.....	.....	260.17	7,965.82	.....	14.55	100.94	.....	.....	13.99	8,355.47	7
8	.....	396.50	.....	1,181.13	7,138.34	.....	3.36	82.86	.....	.....	47.71	8,849.90	8
9	.....	.....	.....	775.39	6,528.70	.....	8.86	77.98	.....	500.00	152.10	8,043.03	9
10	.....	.....	.....	363.17	8,517.75	.....	15.94	109.77	.....	.....	58.61	9,065.24	10
11	.....	.....	.....	305.17	8,303.93	117.00	177.00	389.30	.....	214.00	11.21	9,517.61	11
12	.....	1,050.22	.....	.....	6,624.84	.....	77.28	155.99	.....	200.00	37.37	8,145.70	12
13	.....	.....	.....	1,355.52	10,195.62	1.90	32.25	255.75	.....	.....	3,410.21	15,250.35	13
14	$ 796.25	.....	.....	147.31	6,802.27	143.25	256.09	584.86	.....	.....	34.02	8,764.05	14
15	.....	.....	.....	452.13	6,790.04	.....	114.10	166.33	.....	.....	26.37	7,549.87	15
16	.....	507.50	.....	1,998.25	9,308.55	.....	247.80	219.38	.....	.....	17.91	12,299.39	16
17	2,348.45	2,816.10	$ 1,401.63	902.87	9,663.69	145.02	681.98	445.16	.....	.....	191.50	18,596.40	17
18	.....	.....	1,760.64	3,675.24	13,006.11	.....	836.08	3,688.99	.....	.....	1,470.12	24,437.18	18
19	.....	967.40	.....	2,802.84	13,422.42	.....	502.07	693.06	754.56	84.50	109.29	19,336.14	19
20	1,660.71	4,095.82	1,139.94	1,698.50	16,160.78	.....	533.35	942.84	037.85	.....	36.11	26,905.90	20
21	3,745.08	2,776.53	4,315.32	.....	11,073.57	.....	805.15	611.10	23,616.06	.....	5,165.79	52,108.60	21
22	3,366.20	3,340.20	1,054.34	592.16	12,228.36	.....	508.85	605.67	.....	.....	1,553.48	23,249.26	22
23	.....	.....	.....	1,553.89	13,119.94	134.76	253.75	644.97	.....	.....	28.90	15,736.21	23
24	.....	379.00	358.08	3.78	2,717.12	.....	176.15	277.78	.....	.....	123.05	4,034.96	24
25	14,130.66	6,920.30	2,008.67	158.13	17,052.98	.....	697.22	813.20	24,864.02	.....	.....	66,645.18	25
*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*17,419.61	17,419.61	
	$26,047.35	$23,326.27	$12,038.62	$20,369.96	$223,552.12	$554.75	$6,228.31	$13,014.43	$125,751.29	$3,376.58	$30,633.56	$484,893.24	

* Total assessment for pruning, spraying and removing trees.

Report of the

Bureau of Street Construction and Repair

For the Year Ending

December 31,

1919

Milwaukee, January 13th, 1920.

Mr. Percy Braman,

Deputy Commissioner of Public Works.

Dear Sir:

Following is the annual report of the Bureau of Street Construction and Repairs for the year ending December 31st, 1919.

The season of 1919 was one of numerous delays and set-backs for both the contractor and this department—the labor disputes and delays of material deliveries being the principal causes why this department was not able to complete the entire paving program contemplated for the season of 1919. However, considering the above mentioned, the department was able to complete several jobs which have been hanging fire for a number of years, and which were very badly needed. The work in question being as follows:

Paving of Canal Street, from First Avenue Viaduct to Muskego Avenue. This street was in a most deplorable condition because of the extremely heavy traffic—the business along this street being composed mostly of coal yards and other big manufacturing concerns, which rendered the old pavement, which was a limestone laid on a sand cushion, inadequate to meet the needs of this street. This improvement was a great relief to the people doing businss along this street, it being constructed of Wisconsin granite on an eight-inch concrete foundation. A like condition existed on Commerce Street, from Walnut to Poplar Street. This improvement was also a God-send to the people doing business on this street. This work consisted of removing the old granite blocks, recutting them and paving them back on an eight-inch concrete foundation. A saving was affected here, the fact our being able to use the old material in the street.

Reconstructing of Clinton Street, from Greenfield to Mitchell Street, was another piece of work which was very much needed. The work of paving this street consisted of paving a hard sandstone block on an eight-inch concrete foundation.

We constructed this year 130 cement concrete alleys, or a total of 135,281 square yards, at an average cost of $1.61 per square yard, which price, considering the cost of material and labor, is extremely low, and I wish to say for this work that I have succeeded in bringing our specifications to a point of perfection since 1917, where they rank foremost in the country. This also applies to price and quality of construction of the actual work. I have made some changes in our asphalt specifications which has given us excellent results, and I am satisfied that the great trouble we have experienced heretofore with asphalt pavements shifting will be eliminated in the future.

Our Repair Department has had a most successful season i view of the many difficulties encountered. I am satisfied that ou streets are in better condition generally at the end of 1919 tha they have been in several years past.

We were able to live well within our appropriation both wher new construction and repairs were concerned, which I think, speak well for the economy practised in both branches of this depart ment.

I have received an appropriation of $10,700 for motor equipment which I propose to expend in the purchase of light motor trucks fo use of the repair gangs and thereby cutting a considerable expens from the cost of street repairs by elimination of team hire. I figur that these light trucks will be the means of saving from $50 t $60 per day and will give us much better service than the slow tean with the class of teamsters that we have been employing in th past.

Following is the set of figures showing detailed cost of th various pavements constructed, also detailed figures on repairs o various types of pavements:

NEW CONSTRUCTIONS

STREETS

Type of Pavement	Yardage	Average Cost Per Sq. Yd
St. S. Asphalt	122,107.30	$2.61
Light Traffic Asphalt	25,978.44	2.41
Asphalt Resurface	32,666.78	1.70
Bituminous Concrete	5,623.61	1.84
Hard Sandstone	13,285.26	4.91
Granite	30,979.10	3.73
Brick	2,549.51	3.09
Creosote Block	862.81	4.30
Cement Sidewalks	19,079.34 sq.ft.	.162 sq.ft

ALLEYS

Cement Concrete	135,281.52	$1.61
Bituminous Concrete	1,806.86	1.81
Brick	1,099.64	3.48
Granite	1,784.76	4.12
8 inch Concrete	1,934.23	1.93

REPAIR DIVISION

REPAIR DIVISION

	ASPHALT REPAIRS		PLANT	
	Yards	Cost	Yards	Cost
March	3,738	$ 1,046.41	3,940	$ 974.13
April	8,982	2,706.72	8,954	2,541.07
May	10,760	3,110.59	10,476	2,745.88
June	10,116	2,586.36	9,628	2,835.39
July	5,686	1,399.90	5,506	1,886.16
August	5,832	1,486.84	5,951	1,616.58
September	7,526	1,961.16	7,744	1,950.20
October	10,500	2,882.08	9,518	2,516.89
November	8,300	2,661.97	8,919	2,518.88
	71,440	$19,842.03	70,636	$19,579.18
	AVERAGE COST—$.277		AVERAGE COST—$.277	

TOTAL AVERAGE COST—$.554

BLOCK PAVEMENT REPAIRS

March	868	$ 1,024.12
April	4,532	4,746.32
May	6,927	8,138.84
June	8,912	15,154.98
July	6,352	8,117.06
August	6,217	6,948.37
September	2,693	3,996.72
October	2,352	4,718.04
November	4,068	6,251.09
	42,921	$59,095.54
AVERAGE COST		$1.375

BITUMINOUS MACADAM

May	65,325	$ 46,439.93
June	64,048	38.868.76
July	60,510	38,575.74
August	77,001	31,985.52
September	52,157	31,360.87
October	44,700	28,113.18
November	8,079	5,562.51
	371,820	$220,906.51
AVERAGE COST		$.593

Respectfully submitted,

C. J. VAN ETTA,
Superintendent of St. Construction and Repair.

Department of Public Works

Bureau of Street Sanitation

Annual Report

1919

Milwaukee, January 2, 1920.

Mr. Percy Braman,

Deputy Commissioner of Public Works,

Milwaukee, Wisconsin.

Dear Sir:

Following is the Annual Report of the Bureau of Street Sanitation for the year ending December 31st, 1919, showing detailed statements of the cost and report of work performed:

Cleaning Streets and Alleys.
Ash and Rubbish Collection.
Garbage Collection.
Collection and Removal of Dead Animals.
Catch Basin Cleaning.
Sprinkling.
Flushing.
Minor Street Repairs.
Oiling.
Snow Removal.
Drinking Fountains.
Cutting Weeds.
Election Booths.
Miscellaneous Assessable Service.
Miscellaneous General Service.

CLEANING STREETS AND ALLEYS

During the year 1919, 92,287 cubic yards or 30,762 loads of sweepings were removed.

The cost of labor and team hire for cleaning streets and alleys for the entire season of 1919 was as follows:

Labor	$95,524.57
Team	50,718.66
Machine	4,263.83
Whitewing	67,844.53

From January 1, 1919, to September 30, 1919, labor was paid at the rate of 42c per hour; from October 1, 1919, to December 31, 1919, at the rate of 50c per hour. Teams were rated at $7.00 per day.

ASH AND RUBBISH COLLECTION

The following is a comparison of the yardage and cost of co lection for the past nine years:

1919	Collection—394,865 cubic yards	$369,629
1918	Collection—356,786 cubic yards	281,995
1917	Collection—366,120 cubic yards	266,905
1916	Collection—333,375 cubic yards	216,496
1915	Collection—320,373 cubic yards	211,939
1914	Collection—321,669 cubic yards	226,219
1913	Collection—379,848 cubic yards	225,421
1912	Collection—293,646 cubic yards	229,344
1911	Collection—188,737 cubic yards	174,619

Average cost per cubic yard:

1919	94c
1918	79c
1917	70c
1916	65c
1915	66c
1914	70c
1913	70c
1912	78c
1911	93c

Wages paid labor and teams were at the same rate as show under the caption "Cleaning Streets and Alleys".

As compared with the figures for the year 1918, there is a increase of 15c in the average cost per cubic yard. This is due t the increase of wages to laborers as well as to teams. The co would be materially greater but for the efforts of the superintende in procuring dumping privileges for various places in the Cit convenient and necessitating short hauls.

Statement of Ash and Rubbish Collection 1919

Month	Cubic Yards	Labor ar Team Co
January	59,895	$ 56,144.
February	44,236	41,964.
March	45,024	42,228.
April	40,441	36,184.
May	34,022	27,917.
June	24,839	23,903.
July	11,226	11,528.
August	9,994	10,504.
September	10,098	5,581.
October	22,901	24,141.
November	33,769	33,620.
December	58,420	55,910.
	394,865	$369,629.

GARBAGE COLLECTION

The following are statements of garbage collection in 1919 and comparative cost per ton for the past eight years:

Statement of Garbage Collection 1919

Month	Loads	Tons	Cost of Collection
January	5,555	2,272	$ 13,825.00
February	4,088	1,617	10,135.00
March	4,657	1,924	11,547.50
April	4,878	2,085	12,247.50
May	5,665	2,380	14,055.00
June	6,301	2,899	15,635.00
July	7,047	3,409	17,457.50
August	6,958	3,679	17,010.00
September	6,800	3,604	16,860.00
October	6,928	3,417	17,090.00
November	5,558	2,528	13,777.50
December	5,794	2,236	14,365.00
	70,229	32,050	$174,005.00

Average weight of load, 913 lbs.

Average cost of collection, per ton, $5.43.

Statement of Comparative Cost per Ton in the Past Eight Years:

1919	$5.43
1918	4.83
1917	4.18
1916	3.07
1915	2.87
1914	2.94
1913	2.42
1912	2.47

The wages paid to the collectors were at the rate of $5.00 per day.

Each collector must bring in two loads for a day's work.

COLLECTION AND REMOVAL OF DEAD ANIMALS

For this work we employ one permanent collector, and add a temporary collector during the warm months of the year. The wages paid were at the rate of $5.00 per day, this including the hire of horse and wagon.

Following is a statement of the work performed.

Month	Small Animals	Large Animals	Total	Cost o Collectio
January	224	------	224	$ 130.0
February	218	------	218	120.0
March	248	------	248	137.5
April	294	------	294	130.0
May	294	------	294	135.0
June	406	------	406	195.0
July	398	------	398	265.0
August	392	------	392	260.0
September	320	------	320	260.0
October	283	------	283	135.0
November	243	------	243	125.0
December	216	------	216	135.0
	3,536	------	3,536	$2,027.5

Average cost of collecting small animals was $.57.

Note: Collector was paid $.50 per day more in 1919 than in 1918. Also, less animals were collected.

CATCH BASIN CLEANING

The following is a statement of work done and itemized cost:

Month	Total Cubic Yds. Removed	Cost of Cleaning		
		Labor	Team	Total
January	12	$ 84.32	$ 3.50	$ 87.82
February	3	13.44	1.75	15.19
March	10	19.32	7.00	26.32
April	358	272.30	18.38	290.68
May	433	456.72	189.00	645.72
June	1,788	1,585.68	757.75	2,343.43
July	2,805	2,590.71	1,135.75	3,726.46
August	3,247	3,194.85	1,462.12	4,656.97
September	2,946	2,895.92	728.88	3,624.80
October	2,289	3,268.36	--------	3,268.36
November	------	---------	--------	---------
December	------	---------	--------	---------
Total	13,891	$14,381.62	$4,304.13	$18,685.75

Average cost of cleaning and removing per cubic yard $1.35.

SPRINKLING

The following is a statement of the cost of street sprinkling:

January	$ 14.00
February	78.76
March	130.38
April	844.40
May	4,511.49
June	6,737.46
July	9,891.84
August	8,783.25
September	6,437.82
October	2,991.61
November	293.12
December	--------
	$40,714.13

153,956,469 gallons of water were used for sprinkling at a cost of $9,237.39. The charge for hydrant rent amounted to $9,427.50.

FLUSHING

The following is a statement of the cost of street flushing.

Month	Labor	Team	Total
anuary	$ 250.48	$ 348.25	$ 598.73
ebruary	105.84	251.13	356.97
larch	255,36	864.49	1,119.85
pril	449.82	2,022.12	2,471.94
lay	622.62	2,371.25	2,993.87
une	1,156.70	3,631.24	4,787.94
uly	1,659.34	4,459.00	6,118.34
ugust	1,824.33	4,515.88	6,340.21
eptember	1,593.26	3,809.75	5,403.01
ctober	786.55	3,613.75	4,400.30
ovember	--------	917.00	917.00
ecember	--------	7.00	7.00
	$8,704.30	$26,810.86	$35,515.16

88,440,980 gallons of water were used for flushing at a cost of 5,306.46. Hydrant rental charge amounted to $942.75.

MINOR STREET REPAIRS

The cost of minor street repairs performed by this department was as follows:

Labor	$25,624.02
Team	10,494.74
Material	12,128.44
	$48,247.20

This work consisted of emergency repairs of streets, necessitate by caveins, washouts, etc.; repairing of defective gutters and alle crossings; patching of water-bound macadam roadways to plac them in condition for oiling; raising of cobble stone gutters i places where they would become settled, making drainage impos sible; removing of street crossings of brick or stone and placin macadam instead, thus making the intersections uniform.

This department maintained between six and seven miles o dirt roads with grading machinery and cinders; also in over 15 unimproved alleys, by the use of cinders, we made it possible fo the property holders to approach garages with their machine through these alleys.

A stone crusher was purchased by this department in the mont of May. A total of 6550 cubic yards of stone were crushed at a average cost of $1.35 per cubic yard delivered on the street as com pared with a price of $2.50 per cubic yard for crushed stone pur chased by the City.

OILING

During the season, 142 miles of streets were oiled. The total cos of oiling, including labor, team, oil and other materials, amounte to $252,259.94. Of this amount $229,366.46 was assessable, $198 726.54 for straight oiling and $30,639.92 for resurfacing and oilin macadam streets, and $22,893.48 for non-assessable.

The non-assessable portion was for oiling and alley intersection and public property. The average rate of assessment per front foo was $.148. 1,594,560 gallons of oil were used. Contract price of oi was as follows:

Barber Asphalt Paving Company	.113
Barrett Manufacturing Company	.12
Standard Oil Company	.055

Following is a comparison of street oiling during the past eleven years:

Year	Miles of Streets Oiled	Cost
1909	3	$ 1,585.85
1910	16	5,435.42
1911	71	34,281.34
1912	28	7,120.90
1913	101	54,786.44
1914	114	53,480.26
1915	122	54,578.86
1916	146	108,965.31
1917	126	115,693.39
1918	101	172,237.52
1919	142	252,259.94

SNOW REMOVAL

The total cost of snow removal from streets, street intersections, crosswalks, gutters and private sidewalks amounted to $76,098.09, divided as follows.

Removing of snow from private walks, or assessable service, $12,079.08.

City's portion for removing snow from streets, gutters and public walks:

Labor	$47,044.50
Team	16,974.51
	$64,019.01

DRINKING FOUNTAINS

During the year, five new bubblers were erected at a cost of $578.00.

The expenditure for repairs amounted to $673.27, and for maintenance, $233.48. The charges for water used amounted to $8,208.38.

CUTTING WEEDS

Noxious weeds growing on private property are cut down when necessary and the cost of this work is assessed against the property. This work is done by hand and machine.

During the year $6,477.74 was spent for this purpose and assessed against the property.

ELECTION BOOTHS

This department handles all election booths and equipment for the Election Commission, whenever necessary, and the expense incurred in doing this is paid by said Commission.

The expense of erecting, maintaining and removing booths in connection with the Spring Election, also the Special Election in the Fifth Congressional District, amounted to $8,396.60.

MISCELLANEOUS ASSESSMENT SERVICE

This service is assessed against the property affected, the cost being as follows:

Removing earth from sidewalks, labor	$460.02
Removing earth from sidewalks, team	259.00
Removing dead trees, labor	5.90
Removing dead trees, team	2.63

PLOWING

During the season of 1919, the Bureau of Street Sanitation took full charge of the preparation of vacant lots for the Milwaukee City and County Agricultural Commission, of which body I am a member. The Commission now owns five plows, five disks and two harrows, and with this equipment, this department plowed and harrowed 800 vacant lots. Over 500 of these were prepared for the gardeners at the actual cost of labor. The remaining were for worthy people and were paid for by the Commission.

Besides these vacant lots there were also prepared for cultivation several large plots covering a total of over twenty-three acres. The largest of these, nearly fifteen acres in size, was also piped with three lines in order that sufficient water might be had by the gardeners.

This department also greatly aided both vacant lot and back yard gardeners by hauling to them over 5,000 loads of leaves and street sweepings to be used as fertilizer.

During the Fall and early Winter of 1919-1920, this department began work for the 1920 gardens by plowing the above mentioned and other large tracts.

DREDGING KINNICKINNIC RIVER

In order to stop the overflowing of the Kinnickinnic River, occurring every Spring, the bed of this river was dredged between 1st and 10th Avenues.

The total cost of this work amounted to $559.72.

This also eliminated a very unsanitary condition by keeping the water running during the warm weather, when otherwise it would become stagnant and create odors in a very thickly populated neighborhood.

Respectfully submitted,

CHAS. O. DAVIS,
Supt., Bureau of Street Sanitation.

Report of

Bureau of Bridges and Public Buildings

1919

March 31st, 1920.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

Following is the annual report of the Bureau of Bridges & Public Buildings for the year 1919:

ENGINEERING, CONSTRUCTION AND BRIDGE MAINTAINANCE

Cleveland Avenue Bridge was completed with the exception of the brick pavement of the roadway, which will be placed as soon as the fill is finished on each side.

A new Abutment was built at the west end of Becher Street Bridge.

A new Stairway was built from Greves Street to the 27th Street Viaduct.

DOCKS

A dock was built at the turn of the South Menominee Canal and a piece of land cut away to make better facilities for larger vessels.

A dock was also constructed at the foot of Milwaukee Street.

Plans were made and contracts let for a dock at the foot of Clinton Street and for one at the foot of Johnson Street.

A contract was let for the construction of a Timber and Pile Revetment along the west side of Jones Island for $99,483.00.

On December 10th, 1919, bids were opened for the construction of the New North Avenue Viaduct and Messers. Klug & Smith were the successful bidders. It is expected to begin work on the structure in the early part of 1920 and the work should be completed in about two years.

Plans were prepared for the first section for rebuilding the 16th Street Viaduct, but were objected to by the Board of Public Land Commissioners, they being desirous of having a wider viaduct then the present land owned by the city would permit.

Accordingly $20,000.00 were set aside for repairs and that portion of the steel structure spanning the Chicago, Milwaukee & St. Paul Railroad tracks was taken down and replaced.

Wig-Wag Signals were installed on most of the bridges where deemed necessary.

The Stone Breakwater extending from the foot of Wisconsin Street to the Harbor entrance was completed.

State Street Bridge, which we expected to have under way is apparently no nearer being started than it was seven years ago. Various changes have been proposed and different sets of plans made to endeavor to overcome the objections of an adjacent property owner, but up to the present time without success.

Owing to orders to conserve on material and labor in 1918, a greater amount of repairs had to be done in the replacement of roadways and sidewalks, miscellaneous structural steel repairs, protection piling for bridges, and painting, which had to be stopped sooner than was intended owing to lack of funds.

ARCHITECTURAL DIVISION

The work on the various buildings progressed as satisfactorily as could be expected with the scarcity of labor resulting from war conditions. The cost of the various buildings was comparatively low considering the rapid increase in prices of building materials.

The Safety Zone constructed in front of the City Hall was a much needed improvement, this having been one of the most dangerous crossings in the city.

The various repairs to the City Hall were as enumerated in Table No. 6 and only the most necessary repairs were done.

Construction on two cottages for the Blue Mound Sanatorium, housing eighteen patients each, was started in April and they are now occupied. Two additional cottages were contracted for, their construction is already under way and they will be completed in the spring of 1920.

Plans are being completed for the Blue Mound Sanatorium septic tanks for the sewerage disposal, also for an Administration Building, Domestic Help Building, and Garage.

The Isolation Hospital Administration Building, also the Laundry and Kitchen Building were completed. Plans and specifications for the equipment of the kitchen, laundry machines and refrigerating machine were completed and contracts let for same. The work of installing the kitchen equipment is going on.

The Central Market Scale House and Scales were completed and are now in use.

Preliminary work and plans for the new Central Market and the four outlying markets were completed.

Plans for comfort stations at each side of Grand Avenue Bridge are under preparation.

Attached are tables from 1 to 21 giving a complete distribution of all costs of the various activities of this bureau.

Respectfully submitted,

DAVID McKEITH,
Acting Supt., Bridges and Public Bldgs.

TABLES

No. 1—Construction Work.
No. 2—Bascule Bridges.
No. 3—Swing Bridges.
No. 4—Stationary Bridges and Viaducts.
No. 5—Railroad Bridges.
No. 6—City Hall.
No. 7—Motor Car Records.
No. 8—Municipal Garage.
No. 9—Center Street Natatorium.
No. 10—North Avenue Natatorium.
No. 11—Prairie Street Natatorium.
No. 12—Greenbush Street Natatorium.
No. 13—Greenfield Avenue Natatorium.
No. 14—Jackson Street Natatorium.
No. 15—Fifth Avenue Natatorium.
No. 16—McKinley Park Bath House.
No. 17—South Shore Bath House.
No. 18—Summary Natatoria and Bathing Beaches.
No. 19—Miscellaneous.
No. 20—Overhead.
No. 21—Summary.

TABLE No. 1

CONSTRUCTION

North Ave. Viaduct	$ 3,757.60
West Side Police Station	3,213.60
Breakwater	131,820.01
Electrical Work—5th Ave. Natatorium	326.86
Cleveland Ave. Bridge	6,264.34
Second Unit Store House	265.08
Central Market Scale House	12,907.67
Blue Mound Infirmary—Electrical Work	73.79
Roadways—Blue Mound	2,472.66
Kitchen and Laundry—Isolation Hospital	10,379.36
New 16th St. Viaduct	93.98
Protection Piers and Piling Various Bridges	26,275.07
Roof—Incinerator Plant	1,283.96
New Addition Isolation Hospital	38.07
Dock on Northwest Side of So. Menomonee Canal at So. Water St	13,170.27
Dock on Milwaukee River, Foot of Park St	20.47
Dock at Northeast Side Milwaukee River, Foot of Milwaukee St	6,497.38
Administration Building—Municipal Isolation Hospital	14,390.76
Small Pox Building—Municipal Isolation Hospital	110.00
Administration Building—Blue Mound	1,477.30
Heating Plant—Blue Mound	9.89
Infirmary—Blue Mound	3,112.60
Cottages—Blue Mound	25,033.51
State Street Bridge	701.33
27th Street Stairway	3,676.43
Cedar Street Bridge	7.82
Market Shelters—Center Street, North Avenue and 12th Street	1,120.70
Ward Yard Bldg., 8th and Chestnut Sts	1,540.34
New Building—Isolation Hospital	124.15
Comfort Stations	82.00
Railing—Kilbourn Park	2,016.41
Third Unit—Store House	3,849.23
New Boiler—Isolation Hospital	12.90
Repairing Smoke Stack damaged by lightning—Blue Mound	515.00
Reconstructing Roadway Slab—27th St. Viaduct	745.97
Dock West of Johnson St	221.42
Dock Foot of Clinton St	57.21
Timber Pile Revetment—Jones Island	182.95
Nurses' Home—Isolation Hospital	37.77
Cottages 3 and 4—Blue Mound	9,876.36
Water Meter Repair Shop	758.83
New Sidewalk—Blue Mound	472.61
Repairing Roof of Bay View Police Station	632.52
Comfort Station—Grand Ave	144.73
Putting up Sheds—Street Construction	1,421.68
Making Cupboards for Bridge Houses	1,160.52
TOTAL	$292,353.11

ULE BRIDGES

Superstructure Repairs	Painting	Miscellaneous	Total Repairs	Grand Total	No. of Bridge Openings
14.31	.....	$ 29.54	$ 522.94	8.165.64	10,440

TABLE No. 2

SHOWING COST OF OPERATING, REPAIRING AND MAINTAINING BASCULE BRIDGES

	OPERATION				REPAIRS AND MAINTENANCE												
	Labor	Supplies	Miscellaneous	Total Cost of Operation	Electrical Repairs	House Repairs	Roadway Repairs	Resurfacing Roadway	Sidewalk Repairs	Sidewalks Replaced	Machinery Repairs	Substructure Repairs	Superstructure Repairs	Painting	Miscellaneous	Total Repairs	Grand Total	No of Bridge Openings
Broadway	$ 7 480 36	$ 161 84		$ 7,642 70	$ 119 30	$ 26 48	$ 171 02		$ 12 12		$ 148 67	$ 1 50	$ 14 31		$ 29 54	$ 522 94	$ 8,165 64	10 440
E Water	7 461	202 63		7 664 40	177 21	56 53	6 40				1 662 94	129 16	25 31	$ 1,319 07	56 25	3 432 87	11,097 27	9,436
W Water	7,174 64	150 91		7,325 55	280 54	274 44	631 86	$ 658 65	22 38		239 53	8 00		920 23	59 45	3 094 98	10,420 53	5,778
Huron	6,691 27	137 45		6,828 72	177 23	10 81	125 55	2,400 06	2 45		378 48					3,094 58	9,923 30	4 550
Michigan	6,760 36	150 16		6,910 52	124 92	28 61	40 99	1,670 06			93 48		49 20			2,007 26	8,917 78	4 24
Grand Ave	7 095 24	181 95		7 277 19	153 96	6 40	18 35		5 68		358 93	11 10	37 44		4 34	596 20	7,873 39	3,086
Fulton	6 694 16	138 18		6,832 34	179 36	4 40	39 49				42 80		6 80			272 85	7,105 19	80
Sixth St	6,693 75	178 83		6 872 58	182 72	17 75	279 23	1,628 31	14 69		46 35	8 20	11 20		13 36	2,201 81	9,074 39	882
First Ave	6,740 39	121 71		6,862 10	171 81	6 60	55 31		12 88		80 80	46 00	89 13		26 72	489 25	7,351 35	657
Muskego	6,687 39	147 87	$ 611 64	6,835 26	125 74	140 63	28 90				43 00	12 50		628 09	29 01	1,007 87	7,843 13	1,312
Sixteenth	6 700 26	112 14		6,812 40	98 05	18 46	87 27		12 00		93 75		27 60		2 40	339 53	7,151 93	390
Kinnickinnic	6,723 58	187 68		6,911 26	42 36	27 83	89 51		3 10		2,066 80	9 59	14 60		12 00	2,265 79	9,177 05	894
Cherry	6,572 52	53 81		6,626 33	60 20	98 61	114 02				142 05		112 01	999 10	3 05	1,529 04	8,155 37	3,051
Buffalo	7,124 03	150 88		7,274 91	84 13	5 89	15 69		134 90		102 13		37 15		4 00	383 89	7,658 80	5,272
Total	$96,600 22	$2 076 04	$611 64	$98,676 26	$1,977 55	$723 44	$1,703 59	$6,357 08	$220 20		$5,499 71	$226 05	$424 75	$3 836 49	$240 02	$21,238 86	$119,915 12	

Installing Wig-Wag System 6th St Bridge	$305 55	
Installing Wig-Wag System 1st Ave Bridge	327 81	
Installing Wig-Wag System 16th St Bridge	318 24	
Installing Wig-Wag System Broadway Bridge	423 31	$1,372 91
		$121 288 03

TABLE No. 3

SHOWING COST OF OPERATING, REPAIRING AND MAINTAINING SWING BRIDGES

	OPERATION				REPAIRS AND MAINTENANCE												
	Labor	Supplies	Miscellaneous	Total Cost of Operation	Electrical Repairs	House Repairs	Roadway Repairs	Resurfacing Roadway	Sidewalk Repairs	Sidewalks Replaced	Machinery Repairs	Substructure Repairs	Superstructure Repairs	Painting	Miscellaneous	Total Repairs	Grand Total	No of Bridge Openings
Pleasant	$6,688 74	$141 33		$6,830 07	$47 53	$5 28	$59 76				$9 38		$5 00			$126 95	$6,957 02	642
Cherry and Point	6,654 10	253 44		6,907 54	134 54	151 03	124 40				31 03		6 56			447 56	7,355 10	1,043
Chestnut	6,643 93	81 19		6,725 12	56 47	129 10	81 34		$68 95		56 82		5 00			397 68	7,122 80	2,478
State St	6,507 00	173 56		6 680 56	91 29	11 50	9 85				157 81	$ 97				271 42	6,951 98	2,032
6th Ave	6,670 84	75 51		6 746 35	20 27	3 60	84 26		80				6 80			115 73	6,862 08	109
Canton	6,604 84	71 68		6,676 52	115 44	19 40	52 82				47 58		100 66			335 90	7,012 42	1,321
Becher	6,026 90	120 43		6,147 33	109 78	23 05	109 74		8 17		185 72		84 15		$13 24	534 15	6,681 48	46
Lincoln	6,691 55	121 22		6,812 77	63 64	3 60	196 18		162 75		12 66		19 80			458 63	7,271 40	61
Total	$52,487 90	$1,038 36		$53,526 26	$638 96	$346 56	$718 35		$240 97		$501 00	$ 97	$227 97		$13 24	$2,688 02	$56,214 28	

Installing Wig-Wag System Chestnut St Bridge	$ 454 08	Repairs for 3 Damages by Boats, etc, Chestnut St Bridge	34 81
Installing Wig-Wag System Clinton St Bridge	411 00	Repairs for 1 Damages by Boats, etc, State St. Bridge	166 86
Installing Electrical Operating System Pleasant St Bridge	74 44	Repairs for 1 Damages by Boats, etc, Lincol Ave Bridge	5 00
Installing Electrical Operating System Cherry St Bridge	94 80	Constructing Abutments Becher St Bridge	9,943 49
Installing Electrical Operating System 6th Ave Bridge	39 42	Constructing Temporary Sidewalk Becher St Bridge	280 93
Installing Electrical Operating System Becher St. Bridge	859 99		
Installing Electrical Operating System Lincoln Ave Bridge	149 76		$12,746 14
Repairs for 5 Damages by Boats, etc, Cherry St Bridge	215 67		12,746 14
Repairs for 2 Damages by Boats, etc, Point St Bridge	15 69		$68,973 49

TABLE NO 4

SHOWING COST OF OPERATING AND REPAIRING STATIONARY BRIDGES AND VIADUCTS.

	OPERATION				REPAIRS											
	Labor	Supplies	Miscellaneous	Total	Electrical Lighting	House Repairs	Roadway Repairs	Resurfacing Roadways	Sidewalk Repairs	Sidewalks Replaced	Substructure Repairs	Superstructure Repairs	Painting	Miscellaneous	Total Repairs	Grand Total
Folsom St Bridge	$1,002 41	$ 92		$1,003 33	$ 74	$16 87		$5,205 71	$36 56			$29 05	$1,624 56		$6,913 49	$7,916 82
North Ave Bridge	693 59	14 09		707 68					34 86			24 04			58 90	766 58
Racine St	193 93	93		194 86			147 09		24 25			24 17			195 51	390 37
Humboldt-Commerce	127 61			127 61			3 04								3 04	130 65
Canal							6 04	798 85							804 89	804 89
Dolton St. Viaduct		2 09		2 09			692 69	1,606 63	717 69			2,762 03	1,109 50		6,888 54	6,890 63
Sixth St Viaduct	2,468 51	16 71		2,485 22			2,072 79					6 40	2,749 61		4,828 80	7,314 02
Sixteenth St. Viaduct	2,012 33	17 16		2,029 49	1 24		399 37	4,965 05	207 52			13 40		10,835 20	16,421 78	18,451 27
27th St. Viaduct	1,012 41	32 29		1,044 70			1,175 11					13 47			1,188 58	2,233 28
Highland Boul. Viaduct												9 19			9 19	9 19
Total	$7,510 79	$84 19		$7,594 98	$1 98	$16 87	$4,496 13	$12,576 24	$1,020 88			$2,881 75	$5,483 67	$10,835 20	$37,312 72	44,907 70

Racine St Floor System	$ 136 69
16th St Viaduct—Repairing Structural Steel and Machinery	10,775 53
North Ave Viaduct—Repairing damage by Truck	7 00
	$55,826 92

TABLE NO. 5

SHOWING COST OF MAINTAINING RAILROAD BRIDGES OVER C. & N. W. RY. CO.'S TRACKS

	Labor	Lamps, Material, etc.	Electrical Power	Total
Prospect Avenue	$4.25	$1.91	$39.84	$46.00
Oakland Ave.	6.39	2.43	39.84	48.66
North Avenue	3.38	2.38	39.84	45.60
Bartlett Avenue	3.75	1.91	39.84	45.50
Farwell Avenue	3.36	.97	39.84	44.17
Belleview Place	8.44	2.74	39.86	51.04
Bradford Street	3.55	1.91	39.84	45.30
Total	$33.12	$14.25	$278.90	$326.27

TABLE NO. 6

CITY HALL COSTS

	Total	Unit of Measure	No. Units.	Unit Cost
Heat (less Amount furnished to Municipal Garage)	$8,294.74	Sq. ft. Radiation Surface	26,000	0.319
Electricity (Switch Board Cost)	16,180.54	K. W. Hours	335,558	0.048
Elevators	22,673.63	Elevator Miles	28,569	0.793
Cleaning and Caretaking	24,598.21	Sq. Ft. of Office Space	100,250	0.245
Electric Lighting Maintenance	4,154.30			
Plumbing System	965.65			
Telephone	4,947.96			
General Operation	2,967.21			
Miscellaneous Repairs	5,560.59			
Painting, Changing Wiring, etc	2,976.20			
Total	$93,319.03	Sq. ft. of Office Space	100,250	0.93

TABLE No. 7

TABLE SHOWING RECORD OF CARS IN MUNICIPAL GARAGE

Make of Car	Assigned To	Cost of Repairs, Supplies, Etc.	Share of Garage Costs	Total Costs	Miles Run	Average Cost Per Mile Run	Revenue Earned
1—Ford Roadster	Bridges and Buildings	$ 284.09	$ 96.52	$ 380.61	4,607	$0.082	$ 367.78
2—Ford Touring	Illumination	672.28	228.40	900.68	9,938	.090	859.49
3—Ford Roadster	St. Sanitation	222.53	75.60	298.13	3,456	.086	393.72
4—Ford Light Delivery	Water-Meter Div.	588.13	199.80	787.93	6,736	.117	724.31
5—Ford Touring	Preventorium	310.50	105.49	415.99	4,369	.095	450.89
6—Ford Touring	Garage	445.98	151.50	597.48	6,676	.089	578.60
7—Ford Touring	City Engineer	513.48	174.44	687.92	4,906	.140	482.12
8—Ford Light Delivery	Illumination	1,191.04	404.62	1,595.66	18,198	.087	1,822.41
9—Ford Roadster	Garage and St. Constr.	318.40	108.17	426.57	6,661	.064	509.06
10—Ford Light Delivery	Water-Distribution	525.54	178.54	704.08	8,201	.086	873.64
11—Ford Light Delivery	Water-Meter Div.	451.14	153.26	604.40	4,914	.123	565.40
12—Ford Light Delivery	Water-Meter Div.	266.40	90.50	356.90	3,750	.095	444.46
13—Ford Light Delivery	Water-Meter Div.	389.35	132.26	521.61	6,104	.085	654.85
14—Ford Touring	Health	714.19	242.63	956.82	15,238	.062	1,170.80
15—Ford Light Delivery	St. Construction	884.17	300.37	1,184.54	11,033	.107	1,073.02
16—Ford Roadster	Engineer Examiners	321.51	109.23	430.74	2,599	.165	239.44
17—Ford Touring	Bridges and Bldgs.	202.84	68.90	271.74	4,731	.057	461.11
18—Ford 1-Ton Truck	Water-Distribution	600.24	203.92	804.16	2,686	.299	283.04
19—Ford 1-Ton Truck	Garage	66.17	22.47	88.64	201	.441	24.54
20—Ford Roadster	Fire and Police	4.02	1.35	5.37	27	.199	2.34
21—Ford Roadster	Fire and Police	13.79	4.64	18.43	.....	.....	.....
22—Ford Roadster	Fire and Police	1.22	.41	1.63	19	.086	1.86
23—Ford 1-Ton Truck	Illumination	4.87	1.64	6.51	.....	.....	.....

TABLE No. 7

TABLE SHOWING RECORD OF CARS IN MUNICIPAL GARAGE—Continued

Make of Car	Assigned To	Cost of Repairs, Supplies, Etc.	Share of Garage Costs	Total Costs	Miles Run	Average Cost Per Mile Run	Revenue Earned
24—Ford 1-Ton Truck	Water-Meter	317.76	107.93	425.69	2,938	.144	358.50
25—Ford Roadster	Str. Constr. and Garage	431.18	146.47	577.65	5,922	.097	462.38
26—Ford 1-Ton Truck	Illumination	628.94	213.65	842.59	6,146	.137	714.68
27—Ford 1-Ton Truck	Garage	700.12	237.85	937.97	2,510	.373	298.06
28—Ford Light Delivery	Health	396.47	134.69	531.16	8,182	.064	790.05
29—Ford Roadster	Illumination	461.13	156.65	617.78	8,603	.071	639.76
30—Ford Touring	Land Commission	383.97	130.44	514.41	5,917	.086	487.85
31—Ford Touring	Sealer Weights and Measures	316.88	107.73	424.61	5,693	.074	505.14
32—Overland Touring	City Engineer	466.32	158.40	624.72	5,205	.120	527.24
33—Ford Touring	Garage	341.15	115.90	457.05	5,293	.086	422.31
34—Ford 1-Ton Truck	Garage	465.31	158.08	623.39	5,241	.118	582.98
35—Ford 1-Ton Truck	Water-Meter	322.13	109.44	431.57	4,440	.097	584.57
36—Ford Touring	Sealer Weights and Measures	259.20	88.06	347.26	3,760	.092	375.20
37—Kissel 1½-Ton Truck	Water-Distribution	638.55	216.93	855.48	3,445	.248	509.82
38—Stegeman 1¾-Ton Truck	Water-Distribution	576.08	195.70	771.78	5,572	.121	781.48
39—Diamond T 2-Ton	Water-Distribution	242.60	82.42	325.02	3,772	.086	639.82
40—Ford Touring	City Engineer	281.20	95.53	376.73	3,836	.098	409.31
41—Ford Touring	City Engineer	323.03	109.75	432.78	5,255	.082	508.30
42—Ford Touring	City Engineer	329.47	111.92	441.39	4,820	.092	541.67
43—Ford Touring	Health Dept.	431.69	146.66	578.35	6,762	.085	590.48
44—Chandler Touring	Garage	955.68	324.69	1,280.37	7,844	.163	861.62
46—Diamond T 2-Ton	Garage	241.98	82.20	324.18	2,358	.137	330.82
47—Mitchell Roadster	Garage	298.62	101.45	400.07	675	.593	83.36

TABLE No. 7

TABLE SHOWING RECORD OF CARS IN MUNICIPAL GARAGE—Continued

Make of Car	Assigned To	Cost of Repairs, Supplies, Etc.	Share of Garage Costs	Total Costs	Miles Run	Average Cost Per Mile Run	Revenue Earned
48—Diamond T 2-Ton	Illumination	288.80	98.12	386.92	3,617	.108	566.18
49—Diamond T 2-Ton	Garage	336.34	114.26	450.60	4,426	.102	640.66
50—Dodge Touring	Garage	411.55	139.82	551.37	8,054	.068	771.22
51—Dodge Touring	City Treasurer	639.26	217.18	856.44	7,783	.11	749.86
52—Dodge Roadster	Davis St. Sanitation	428.44	145.55	573.99	6,166	.093	640.48
53—Dodge Touring	St. Construction	385.68	131.03	516.71	7,300	.07	710.88
54—Maxwell Touring	Garage	487.32	165.55	652.87	4,287	.152	382.50
55—Dodge Roadster	St. Construction	654.83	222.47	877.30	8,808	.10	765.76
56—Dodge Roadster	St.Sanitation	242.41	82.35	324.76	1,897	.172	218.72
57—Maxwell Roadster	Garage	275.21	93.50	368.71	3,018	.122	278.77
58—Maxwell Roadster	Water-Meter Div.	617.81	209.90	827.71	9,619	.086	845.06
59—Dodge Touring	Garage	333.89	113.43	447.32	547	.817	75.06
60—Com'l. Elec. Spec. Tower	Illumination	11.11	3.78	14.89	2,737	.....	.....
61—Harley-Davidson M. C.	Garage	38.97	13.24	52.21	334	.156	3.34
62—Ford Roadster	Fire and Police Alarm	139.34	47.34	186.68	3,504	.053	296.28
63—Ford Touring	Supt. of Garage	6.68	2.27	8.95	.....	.....	.....
Total		$24,098.98	$8,186.99	$32,285.97	311,336	$.104	$30,933.05

TABLE No. 8

MUNICIPAL GARAGE

Cost of New Cars	$13,588.8
Cost of New Equipment, Tools, etc	1,347.4
Cost of Operating Garage	9,510.3
Cost of Operating and Maintaining Cars	24,098.9
Repairs to Garage	291.6
Cost of Heating 2,950 sq. ft. Radiation @ .319 Furnished by City Hall Power Plant	941.0
	$49,778.2
Total Mileage for all Cars under Garage Management	311,33
Amount Billed to various Departments for Use of Cars and Chauffeurs	$32,256.3

TABLE NO. 9

CENTER ST. NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Total Attendance	Cost per Bather
January	$348.90	$425.99	.....	$17.75	$792.64	$63.50	$729.14	2,216	447	2,663	.274
February	357.69	322.61	.....	12.15	692.45	59.60	632.85	2,258	399	2,657	.238
March	357.23	373.53	.....	15.45	746.21	96.20	650.01	3,780	513	4,293	.152
April	351.46	264.67	.....	19.65	635.78	109.05	526.73	3,849	719	4,568	.115
May	346.89	275.26	.....	20.15	642.30	168.40	473.90	6,055	1,719	7,774	.061
June	334.51	213.55	.....	41.35	589.41	161.20	428.21	6,687	4,614	11,301	.039
July	417.38	264.90	$290.00	48.20	1,020.48	184.90	835.58	8,478	6,361	14,839	.056
August	422.98	166.29	3.12	47.95	640.34	226.75	413.59	9,075	4,122	13,197	.031
September	340.51	172.39	160.53	46.45	719.88	184.50	535.38	7,289	3,083	10,372	.052
October	362.12	303.49	4.50	28.00	698.11	108.25	589.86	3,557	1,400	4,957	.118
November	348.02	323.65	783.36	21.95	1,476.98	75.85	1,401.13	1,958	378	2,336	.60
December	353.20	236.38	118.96	25.80	734.28	97.70	636.58	2,341	431	2,772	.23
Total	$4,340.89	$3,342.71	$1,360.41	$344.85	$9,388.86	$1,535.90	$7,852.96	57,543	24,186	81,729	.096

TABLE NO. 10.

NORTH AVENUE NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Total Attendance	Cost per Bather
January	$402.62	$411.64	$2.50	$14.40	$831.16	$58.28	$772.88	2,621	736	3,357	.23
February	401.95	341.01	1.04	13.60	757.60	52.35	705.25	2,554	682	3,236	.224
March	395.60	375.10	.....	17.15	787.85	82.60	705.25	3,864	943	4,807	.146
April	391.66	323.90	.....	31.55	747.11	75.55	671.56	3,275	709	3,984	.172
May	371.94	266.54	618.25	14.65	1,271.38	83.50	1,187.88	3,473	517	3,990	.292
June	374.02	276.57	.....	65.13	715.72	208.35	507.37	9,478	4,562	14,040	.036
July	505.94	305.26	4.75	61.65	877.60	224.35	653.25	12,762	5,147	17,909	.036
August	463.86	189.21	.....	57.40	710.47	227.65	482.82	13,623	5,110	18,733	.026
September	365.78	179.59	2.59	44.55	592.51	165.90	426.61	7,764	2,901	10,665	.04
October	406.44	350.42	11.52	43.25	811.63	145.00	666.63	5,989	2,696	8,685	.076
November	409.72	359.80	.....	35.40	804.92	137.10	667.82	4,405	922	5,327	.125
December	398.13	326.80	.....	21.05	745.98	86.80	659.18	2,976	435	3,411	.193
Amount Charged to Library Board for Heating Branch Library					.....	601.70	.....	.....	.....	.....	....
Total	$4,887.66	$3,705.84	$640.65	$419.78	$9,653.93	$2,149.13	$7,504.80	72,784	25,360	98,144	.076

TABLE NO. 11

PRAIRIE ST. NATATORIUM.

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost per Bather
January	$434.69	$259.19	$9.83	$26.20	$729.91	$125.20	$604.71	3,148	1,048	4,196	.144
February	388.08	617.65	6.68	19.75	1,032.16	105.75	926.41	2,720	905	3,625	.255
March	416.75	465.63	.....	26.35	908.73	172.20	736.53	4,020	952	4,972	.148
April	423.61	204.63	34.00	40.25	702.49	176.20	526.29	4,376	1,190	5,566	.094
May	410.98	449.03	20.00	25.45	905.46	191.20	714.26	4,893	1,382	6,275	.112
June	544.54	188.21	.....	55.25	78,800	238.10	54,990	5,646	1,530	7,176	.076
July	502.28	192.79	601.15	90.35	1,386.57	400.95	986.62	10,388	3,666	14,054	.07
August	504.29	296.55	170.00	80.60	1,051.44	420.00	631.44	13,167	3,220	16,387	.037
September	443.06	243.25	.....	61.50	747.81	282.35	465.46	7,544	2,088	9,632	.048
October	399.47	377.60	.....	74.64	851.71	220.60	631.11	5,701	1,756	7,457	.084
November	410.27	304.99	2.75	36.75	754.76	198.20	556.56	4,547	829	5,376	.103
December	414.84	350.97	4.97	24.75	795.53	142.20	653.33	3,030	803	3,833	.178
	$5,292.86	$3,950.49	$849.38	$561.84	$10,654.57	$2,672.95	$7,981.62	69,180	19,369	88,549	.09

TABLE NO. 12

GREENBUSH ST. NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost per Bather
January	$380.70	$266.72	$31.65	$22.95	$702.02	$110.60	$591.42	2,623	388	3,011	.229
February	359.40	366.77	.....	22.35	748.52	100.20	648.32	2,424	366	2,790	.232
March	365.96	353.37	.....	41.95	761.28	177.75	583.53	4,469	512	4,981	.117
April	386.83	213.30	.....	30.60	630.73	182.85	447.88	4,747	691	5,438	.082
May	360.32	373.01	21.63	39.50	794.46	261.00	533.46	6,340	1,205	7,545	.07
June	362.86	275.90	6.58	88.70	734.04	344.45	389.59	8,761	2,301	11,062	.035
July	448.71	208.39	.....	79.80	736.90	410.70	326.20	11,806	2,747	14,553	.022
August	448.45	290.24	.....	92.83	831.52	395 45	436.07	11,708	2,850	14,558	.03
September	378.29	230.44	.....	38.30	647.03	266.50	380.53	7,059	2,147	9,206	.041
October	360.76	343.22	.....	48.05	752.03	225.70	526.33	6,128	1,702	7,830	.067
November	374.54	267.27	63.40	40.05	745.26	202.45	542.81	4,762	691	5,453	.10
December	401.59	307.77	208.89	36.35	954.60	144.65	809.95	3,187	511	3,698	.219
	$4,628.41	$3,496.40	$332.15	$581.43	$9,038.39	$2,822.30	$6,216.09	74,014	16,111	90 125	.069

TABLE NO. 13

GREENFIELD AVENUE NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost per Bather
January	$362.92	$260.26	.....	$24.18	$647.36	$107.65	$539.71	3,263	417	3,680	.15
February	363.90	472.16	.....	25.00	861.06	104.40	756.66	3,316	528	3,844	.19
March	400.07	326.17	5.10	43.45	774.79	177.75	597.04	5,774	612	6,386	.094
April	360.85	219.79	.....	43.35	623.99	192.40	431.59	6,402	833	7,235	.06
May	366.71	453.42	.....	42.50	862.63	259.90	602.73	8,291	1,570	9,861	.061
June	377.51	169.73	.....	82.10	629.34	347.55	281.79	11,747	5,460	17,207	.016
July	460.30	258.81	.....	73.50	792.61	408.30	384.31	14,979	7,897	22,876	.016
August	445.88	236.64	.....	99.95	782.47	424.35	358.12	16,697	5,911	22,608	.016
September	380.84	231.25	3.25	67.95	683.29	304.90	378.39	10,348	2,734	13,082	.028
October	406.50	321.48	1.00	51.80	780.78	242.50	538.28	7,180	1,410	8,590	.063
November	431.29	303.60	11.62	62.24	808.75	226.35	582.40	5,454	568	6,022	.097
December	411.98	336.66	8.65	47.55	804.84	165.70	639.14	3,710	268	3,978	.16
	$4,768.75	$3,589.97	$29.62	$663.57	$9,051.91	$2,961.75	$6,090.16	97,161	28,208	125,369	.049

TABLE NO. 14

JACKSON STREET NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Am't Chargeable to School Board	Net	Attendance Male	Attendance Female	Attendance Total	Cost per Bather
January	$302.62	$820.18	$ 26.74	$ 19.40	$1,168.94	$ 56.90	$329.99	$782.05	2,491	1,027	3,508	.222
February	296.70	925.92	8.61	18.25	1,249.48	51.85	370.38	827.25	3,004	1,392	4,396	.188
March	309.29	879.96	.....	23.60	1,212.85	68.55	351.99	792.31	3,411	955	4,366	.181
April	305.00	610.66	128.40	18.45	1,062.51	53.15	250.28	759.08	1,853	937	2,790	.272
May	425.15	576.77	178.95	30.15	1,211.02	129.85	224.69	856.48	5,295	1,773	7,068	.121
June	398.89	455.07	.....	49.05	903.01	183.70	182.03	537.28	7,926	3,575	11,501	.047
July	512.50	557.48	735.29	74.80	1,880.07	224.95	233.76	1,421.36	7,679	3,003	10,682	.133
August	488.86	393.83	71.52	59.75	1,013.96	205.25	158.72	649.99	7,643	3,267	10,910	.059
September	404.42	425.47	4.30	44.40	878.59	149.30	171.39	557.90	6,800	4,278	11,078	.05
October	394.54	507.67	25.00	29.05	956.26	60.25	204.27	691.74	3,770	2,162	5,932	.116
November	421.52	769.07	215.74	32.40	1,438.73	107.10	304.61	1,027.02	5,914	2,840	8,754	.117
December	439.56	782.25	38.62	25.80	1,286.23	86.85	306.90	892.48	4,846	2,701	7,547	.118
	$4,699.05	$7,704.33	$1,433.17	$425.10	$14,261.65	$1,377.70	$3,089.01	$9,794.94	60,622	27,910	88,532	.116

TABLE No. 15

FIFTH AVE. NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Total Attendance	Cost Per Bather
January	$390.51	$114.72	.....	$ 13.85	$519.08	$ 56.05	$463.03	1,720	825	2,545	.182
February	333.66	444.79	.....	17.15	795.60	64.20	731.40	2,650	1,127	3,777	.193
March	495.12	329.94	$204.27	25.40	1,054.73	102.95	951.78	4,707	972	5,679	.167
April	409.16	240.15	5.18	32.15	686.64	135.10	551.54	5,391	1,684	7,075	.078
May	494.27	333.70	53.42	31.65	913.04	180.10	732.94	7,665	2,135	9,800	.075
June	403.33	158.28	.....	83.73	645.34	306.25	339.09	9,767	4,018	13,785	.025
July	440.94	245.97	29.23	109.60	825.74	389.45	436.29	14,414	5,158	19,572	.022
August	453.14	279.41	35.75	85.55	853.85	363.05	490.80	15,286	5,220	20,506	.024
September	486.95	263.90	7.21	61.30	819.36	243.95	575.41	7,966	3,809	11,775	.048
October	381.61	295.46	109.37	63.25	849.69	192.55	657.14	5,944	1,912	7,856	.084
November	404.44	338.03	15.36	40.00	797.83	166.90	630.93	4,350	1,145	5,495	.115
December	573.07	287.14	82.63	38.05	980.89	118.60	862.29	2,812	1,062	3,874	.224
	$5,266.20	$3,331.49	$542.42	$601.68	$9,741.79	$2,319.15	$7,422.64	82,672	29,067	111,739	.066

TABLE No. 16

McKINLEY

	Operation	Maint. and Repairs	Gross	Receipts	Net	Total Attendance	Cost per Bather
January	$192.80	.....	$192.80	.....	$192.80	.....	.....
February	197.00	.....	197.00	.....	197.00	.....	.....
March	192.12	.....	192.12	.....	192.12	.....	.....
April	192.00	.....	192.00	.....	192.00	.....	.....
May	212.44	$17.92	230.36	.....	230.36	.....	.....
June	1,432.96	2.80	1,435.76	$411.55	1,024.21	13,964	.073
July	2,016.87	76.15	2,093.02	825.20	1,267.82	35,540	.036
August	1,866.21	3.00	1,869.21	288.15	1,581.06	17,496	.09
September	1,326.90	.....	1,326.90	64.95	1,261.95	2,280	.553
October	197.25	.....	197.25	.....	197.25	.....	.....
November	188.14	24.20	212.34	.....	212.34	.....	.....
December	194.06	.....	194.06	.....	194.06	.....	.....
	$8,208.75	$124.07	$8,332.82	$1,589.85	$6,742.97	69,280	.097

Cost of Remodeling Upper Floor of Bath House for the use of Lockers—
Job X-97 ..... $697.86

TABLE NO. 17

SOUTH SHORE

	Operation	Maint. and Repairs	Gross	Receipts	Net	Total Attendance	Cost per Bather
January	$104.22	.....	$104.22	.....	$104.22	.....	.....
February	109.82	.....	109.82	.....	109.82	.....	.....
March	104.34	.....	104.34	.....	104.34	.....	.....
April	108.88	$9.55	118.43	.....	118.43	.....	.....
May	108.88	3.32	112.20	.....	112.20	.....	.....
June	1,163.44	.....	1,163.44	$221.85	941.59	8,896	$.106
July	1,727.45	122.40	1,849.85	777.75	1,072.10	32,837	.033
August	1,737.54	233.68	1,971.22	331.95	1,639.27	18,129	.09
September	989.40	.....	989.40	43.35	946.05	1,825	.518
October	148.23	.....	148.23	.....	148.23	.....	.....
November	106.37	15.00	121.37	.....	121.37	.....	.....
December	103.44	.....	103.44	.....	103.44	.....	.....
	$6,512.01	$383.95	$6,895.96	$1,374.90	$5,521.06	61,887	$.087

TABLE NO. 18

SUMMARY NATATORIA AND BATHING BEACHES

	General Operation	Heat	Repairs	Laundry	Gross	Rental Receipts	Other Receipts	Net	Total Attendance	Cost per Bather
Natatoria										
Center St.	$4,340.89	$3,342.71	$1,360.41	$344.85	$9,388.86	$1,535.90	.....	$7,852.96	81,729	.096
North Ave.	4,887.66	3,705.84	040.65	419.78	9,653.93	1,547.43	$601.70	7,504.80	98,144	.076
Prairie St.	5,292.86	3,950.49	849.38	561.84	10,654.57	2,672.95	.....	7,981.62	88,549	.09
Greenbush St.	4,628.41	3.496.40	332.15	581.43	9,038.39	2,822.30	.....	6,216.09	90,125	.069
Greenfield Ave.	4,768.75	3,589.97	29.62	663.57	9,051.91	2,961.75	.....	6,090.16	125,369	.049
Jackson St.	4,699.05	7,704.33	1,433.17	425.10	14,261.65	1,377.70	3,089.01	9,794.94	88,532	.116
5th Ave.	5,266.20	3.331.49	542.42	601.68	9,741.79	2,319.15	.....	7,422.64	111,739	.066
Bath Houses										
McKinley	8,208.75	.....	124.07	.....	8,332.82	1,589.85	.....	6,742.97	69,280	.097
So. Shore	6,512.01	.....	383.95	.....	6,895.96	1,374.90	.....	5,521.06	61,887	.087
Totals	$48,604.58	$29,121.23	$5,695.82	$3,598.25	$87.019.88	$18,201.93	$3,690.71	$65,127.24	815,354	.08
Remodeling at McKinley Park Bath House					$697.86	.....	.....	.....	.....	
					$87,717.74	.....	.....	.....	.....	.....

TABLE No. 19

MISCELLANEOUS COST

Comfort Station	$ 859.87
Central Market	4,498.66
Small Markets	356.58
Work for Other Departments	3,776.96
Odd Jobs	960.70
	$10,452.77

TABLE No. 20

SHOWING OVERHEAD EXPENSES

Salaries and Expense—General Supervision	$ 2,531.26
Salaries and Expense—Field Supervision—Not Chargeable Elsewhere	647.84
Engineering Salaries and Expense—Not Chargeable Elsewhere	2,367.26
Salaries—Central Office—Clerical	7,202.50
Central Office—Supplies and Miscellaneous Expense	689.67
Stable Supplies and Expense—Including Teamster Service	1,450.47
Wages and Expense—Storekeeping	2,902.66
Other Expense not Otherwise Provided for—Including Pay for Vacations of Day Workers	1,077.92
Launches	1,458.04
Care of Equipment	707.85
	$21,035.47

SUMMARY

Construction	$292,353.11
Bascule Bridges	121,288.03
Swing Bridges	68,933.49
Stationary Bridges and Viaducts	55,826.92
Railroad Bridges	326.27
City Hall	93,319.03
Municipal Garage	49,778.23
Bathing Stations	87,717.74
Miscellaneous	10,452.77
TOTAL	$779,995.59
Overhead	21,035.47
Overhead Percentage	.027

TABLE SHOWING BOUNDARY LINES AND NUMBER OF INSPECTIONS MADE IN THE VARIOUS DIVISIONS OF THE CITY OF MILWAUKEE.

Boundary	
East Division — Wm. Smith	All that part lying East of the Milwaukee River [illegible]
West Division — P. J. King	All that part bounded South by the Menomonee River, North by Galena St., East by Milwaukee River, West by [illegible] part of Wauwatosa
West Division — Edw. Witt	All that part lying North of Galena St. and West of 20th St.
West Division — A. G. Ba[illegible]n	All that part lying West of 20th St. bounded on the South by Galena St. and on the North by [illegible] St.
West Division — L. A. Mehner	All that part lying North of Galena St. bounded on the East by the Milwaukee River and on the West by 7th St.
West Division — W. G. Nern	All that part lying North of Galena St. and bounded on the East by 7th St. and on the West by 20th St.
South Division — J. J. Horsch	All that part lying West of 11th Ave. from the Menomonee River South to and including parts of West Milwaukee, Town of Greenfield and Town of Lake
South Division — A. W. Starck	All that part lying between 1st and 11th Av. from the Menomonee River South to and including a part of Town of Lake
South Division — F. C. Balbi* / J. S. Savage	All that part lying East of 1st Ave. from the Menomonee River South to and including a part of the Town of Lake

EAST DIVISION and WEST DIVISION

Months	Wm. Smith Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	P. J. King Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	Edw. Witt Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection
January	7	5	6		1 796	54	18	5	2	1 91	42	74	8	5	1 201
February	74	17	3	1	1 556	75	50	8		1 111	41	31	5		1 921
March	55	49	1	3	1 342	95	61	5	6	892	31	142	1	7	803
April	165	98	2	7	692	102	142	8	8	583	85	116	15	5	693
May	140	175	10	1	455	118	98	16	5	655	94	153	12	4	567
June	120	49	8	14	383	131	90	7	3	642	73	73	4	2	913
July	96	137	9	11	647	147	89	18	5	662	140	327	18	15	303
August	176	198	8	10	477	72	74	11	8	1 127	125	206	16	11	505
September	136	127	20	11	635	129	134	19	12	641	126	224	14	12	473
October	182	215	26	18	426	156	87	25	6	687	115	408	17	7	318
November	173	257	32	16	392	128	86	20	11	776	77	236	12	6	530
December	143	93	23	11	709	95	47	15	1	1 167	73	109	21	7	912
Total Plumbing Inspections	1452					1302					1002				
Total Drain Inspections		1618					976					2119			
Total Plumbing Rejections			151					157					143		
Total Drain Rejections				104					67					77	
Percentage Plumbing Rejections			104					12					142		
Percentage Drain Rejections				.064					.068					.036	
Percentage Total Rejections			.083					.098					.07		
Average Time Minutes Per Inspect.				40.9					54.4					41.7	
Average Cost per Inspection					794					797					578
Total for Year	3070		255			2278		224			3121		220		

WEST DIVISION (continued)

Months	A. G. Ba[illegible]n Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	L. A. Mehner Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	W. G. Nern Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection
January	16	67	6	6	1 229	36	14	4	1	2 761	53	32	2		1 631
February	28	47	2	3	1 851	36	22	9	2	2 387	47	11	7		2 362
March	47	92	[illegible]	[illegible]	1 002	63	44	7	5	1 307	54	44	6	2	1 412
April	73	157	7	12	1 002	70	42	5	7	1 252	79	73	8	3	918
May	85	212	9	17	473	101	74	9	12	807	96	70	11	1	843
June	64	82	9	4	947	119	137	21	21	557	104	120	8	3	629
July	152	233	19	14	388	143	136	24	11	514	91	68	8	4	877
August	112	192	20	10	546	153	191	23	22	504	81	69	7	1	1 097
September	94	164	10	6	642	137	159	31	5	566	116	94	24	5	.792
October	141	253	19	28	337	76	107	7	13	899	123	109	14	4	.72
November	84	198	16	13	589	88	94	11	15	918	95	115	12	2	.787
December	82	90	16	10	967	68	66	13	5	1 238	98	22	13	....	1 359
Total Plumbing Inspections	988					1090					1037				
Total Drain Inspections		1887					1086					827			
Total Plumbing Rejections			135					164					120		
Total Drain Rejections				128					119					25	
Percentage Plumbing Rejections			136					.15					115		
Percentage Drain Rejections				067					109					.03	
Percentage Total Rejections			091					13					.077		
Average Time Minutes Per Inspect.				46.4					39.8					53.3	
Average Cost per Inspection					629					837					966
Total for Year	2875		263			2176		283			1864		145		

SOUTH DIVISION

Months	J. J. Horsch Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	A. W. Starck Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection	F. C. Balbi* J. S. Savage Plumbing Inspected	Drain Inspected	Plumbing Rejected	Drain Rejected	Cost Per Inspection
January	26	13	3		3 494	20	11	1	2	4 419	37	24	2	1	2 278
February	32	14	6		2 971	53	22	6	1	1 85	32	35	5	1	2 07
March	65	100	9	5	848	49	39	5	3	1 573	63	38	4	7	1 381
April	99	110	9	5	669	57	43	3	..	1 393	78	120	9	13	.712
May	136	219	14	15	396	83	88	6	9	818	99	153	8	14	561
June	104	182	11	17	.490	102	229	11	10	424	85	126	7	4	666
July	142	178	20	3	439	61	69	5	6	1 064	118	167	18	23	498
August	107	148	11	10	645	126	134	11	6	666	99	83	18	7	912
September	58	113	5	7	954	122	126	12	16	669	55	68	19	12	1 331
October	68	226	7	14	.56	140	231	23	14	.451	112	196	25	14	544
November	109	291	19	15	.417	106	82	10	5	883	96	68	15	4	1 014
December	114	90	35	8	811	61	34	6	1	1 731	92	53	28	8	1 141
Total Plumbing Inspections	1060	....	....	....	.....	980	....	....	....	.....	966				
Total Drain Inspections	...	1684	...	..	.....	....	1108	...	....	.....		1131			
Total Plumbing Rejections	...	..	149	....	.....	.....	...	97	..	.....			158		
Total Drain Rejections	.....	..	....	99	.....	....	....	....	73	..	....			108	
Percentage Plumbing Rejections	....	..	.14	....	.....	....	...	098	....				163		
Percentage Drain Rejections	...	...	....	.058	.....	.....	....	.....	.065	.....				095	
Percentage Total Rejections	....	....	.09		.....	.....	....	.081		....			126		
Average Time Minutes Per Inspect.	.....	..	...	40.7	.....	.....	....	..	59.4	...				58.8	
Average Cost per Inspection	...	...		..	656	.....	..	...	....	867					863
Total for Year	2744		248		....	2088		170			2097		266		

RECAPITULATION

Months	Total Plumbing Inspections	Total Drain Inspections	Total Inspections	Total Plumbing Rejections	Total Drain Rejections	Total Rejections	Percentage Plumbing Rejections	Percentage Drain Rejections	Percentage Total Rejections	Average Time Minutes per Inspection	Average Cost per Inspection	Cost
January	386	258	644	37	17	54	096	066	084	52	1 9[illegible]	1 24[illegible]
February	418	247	665	51	8	59	122	032	089	51	1 872	1 244.6[illegible]
March	522	609	1131	43	13	56	082	071	077	38	1 10[illegible]	1 252.30
April	748	901	1649	66	60	126	088	067	077	32	765	1 262.[illegible]
May	952	1242	2194	95	81	176	099	065	080	28	579	1 26[illegible]
June	888	1308	2196	86	76	162	097	059	074	26	591	1 26[illegible]
July	1064	1404	2468	137	90	227	128	065	091	24	514	1 268.[illegible]
August	1031	1295	2326	125	85	210	121	066	090	26	545	1 [illegible]
September	973	1209	2182	154	86	240	158	071	011	26	684	1 493.[illegible]
October	1113	1932	3045	163	116	279	145	060	092	23	495	1 501.40
November	956	1427	2383	147	87	234	154	061	099	25	625	1 498.[illegible]
December	826	604	1430	170	51	221	205	084	155	37	1 012	1 490.[illegible]
Total Plumbing Inspections	9877											
Total Drain Inspections		12436										
Total Plumbing Rejections				1274								
Total Drain Rejections					800							
Percentage Plumbing Rejections							129					
Percentage Drain Rejections								064				
Percentage Total Rejections									093			
Average Time Minutes Per Inspect.										47.4		
Average Cost per Inspection											731	
Total for Year		22313			2074							16,299.46

ANNUAL REPORT

of the Superintendent of

PLUMBING AND HOUSE DRAIN LAYING

Milwaukee, January 6, 1920.

Mr. Peter Bo[illegible],

Commissioner of Public Works.

Dear Sir:

I respectfully submit herewith the annual report of the Department of Plumbing and House Drain Laying for the year ending December 31st, 1919. The attached table shows the division of the City into [illegible] districts and the number of [illegible] inspected.

I wish to thank Mr. [illegible] for [illegible] rendered the department [illegible] during the year.

Respectfully submitted,

GEO. E. STOLZ

Superintendent

DIVISIONS	[illegible]	[illegible] 1919	1918	1913	[illegible] and Cancellation 1919	1918	1917	1916	1915	1913	Unfinished Plans 1919	1918	1917	1916	1915
West	2573	13	2		2240	207	17	.	1	.	333	12	4	....	...
East	467	3	2		381	26	8				86	1	..	...	.
South	1250	11	1	1	1006	89	8		1	2	244	5	4	2	1
Town Lake	21				8	1		..	.	..	13	...	....	..	..
Shorewood	149				45	3	16			.	104	3	....	2	
West Milwaukee	202				86	2				...	116	.	....	..	
Town Greenfield	24	1	.	..	24	2			.	.	..	..	...	..	...
Town Wauwatosa	105	1		.	75	11		.	.	..	30	1	...	....	.
Total	4791	29	5	1	3865	341	49	....	2	2	926	22	8	4	1

ORGANIZATION

Superintendent of Plumbing and House Drain	$ 2 [illegible]
Deputy Superintendent of Plumbing and House Drains	1 800.00
Nine Field Inspectors	14 580.00
Transportation Street Car Fare	571.48
Junior Clerk Stenographer	
Total	$19,111.48

* Territory covered by J. S. Savage up to January 31st, 1919. Mr. F. J. Balbi having obtained his discharge from the U. S. Service again assumed his duties on February 1st, 1919.

Report of

City Engineer

For the Year Ending

December 31, 1919

January 21st, 1920.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

In compliance with the requirements of the City Charter, I herewith submit to you the report of the operations of the Bureau of Engineers for the year ending December 31st, 1919:

The following is the organization and employes in the Bureau of Engineers:

GENERAL OFFICE

George F. Staal ---------- City Engineer
Edward F. Petersik ---------- Principal Clerk
Daisy Vojtik ---------- Clerk-Stenographer

ENGINEERING DIVISION

Ed. F. Leidel ---------- Chief Engineer—Sewers

FIELD ENGINEERS

Fred Hornbach ---------- Senior Engineer—South
John G. Baumgartner ---------- Asst. Civil Engineer—South
Fred W. Banholzer ---------- Junior Engineer—South
Willard J. Pendergast ---------- Rodman—South
Geo. Schmidt ---------- Rodman—South
Ervin L. Knebes ---------- Senior Engineer—West
Joseph Richter ---------- Asst. Civil Engineer—West
Leon Glasgow ---------- Junior Engineer—West
Robert Baumgartner ---------- Rodman—West
Wm. F. Hunt ---------- Senior Engineer—East
Harry Nelson ---------- Asst. Civil Engineer—East
Wm. C. Herdina ---------- Junior Engineer—East
Walter G. Bonawitz ---------- Rodman—East
Orie B. Mohr ---------- Rodman—East
James C. Berenson ---------- Senior Engineer—North
August F. Bussian ---------- Asst. Civil Engineer—North
Theodore Gauger ---------- Rodman—North
Alois Weiand ---------- Rodman—North

ESTIMATING DEPARTMENT

Frank Nahrath	Chief Engr. Estimator
Oscar E. R. Ludovici	Engr. Estimator
George Eigner Jr.	Engr. Estimator
Walter Kuechle	Engr. Estimator

DRAFTING DEPARTMENT

Charles L. Eastman	Chief Draftsman
Gustav A. Uhlmann	Asst. Struc. Designer
Bruno P. Schaefer	Engr. Draftsman
Henry W. Leenhouts	Map Engr. Draftsman
Joseph Sikorra	Map Engr. Draftsman
Louis Klabunde	Draftsman

RIVER SURVEY

Herbert C. Schmitt	Senior Engineer
Frank A. Kaiser	Asst. Civil Engineer
Theodore Witteman	Rodman

ENGINEERING DIVISION OF WATER DEPARTMENT

C. S. Gruetzmacher	Civil Engineer of Designs
A. H. Raetzmann	Civil Engr. of Construction
H. A. Peterman	Assistant Civil Engineer
Geo. W. Fels	Assistant Civil Engineer
R. S. LaPhilliph	Draftsman

STREETS AND ALLEYS

The length of streets and alleys improved during the year 1919, are as follows:

Streets improved	11.637 miles
Streets paved	9.555 miles
Alleys paved	14.307 miles

The total cost of street and alley improvements amounted to $1,069,907.33 of which amount $947,845.09 was assessed against abutting property as benefits. The improvements made and the cost thereof are shown by the following statement.

STREET IMPROVEMENTS

64,826.25	cu. yds. of excavating	$ 76,238.24
14,463.00	cu. yds. of filling	14,382.35
142,911.31	sq. yds. of asphalt pavement	365,853.56
33,448.51	sq. yds. of asphalt top removed	10,070.15
32,696.43	sq. yds. of asphalt resurfacing	55,824.65
7,060.49	sq. yds. of asphalt pavement removed	3,775.72
14,889.93	cu. ft. of extra binder	5,211.47
4,415.04	sq. yds. of bituminous concrete paving	8,097.99
2,628.34	sq. yds. of concrete removed	1,441.79
3,073.62	sq. yds. of brick pavement	8,661.25
4,143.83	sq. yds. of brick pavement removed	497.26
12,624.84	sq. yds. of brick gutter	41,932.05
8,137.26	sq. yds. of sandstone block pavement	37,719.40
163.25	cu. yds. concrete	1,184.25
4,199.14	sq. yds. granite block pavement	15,813.10
15.50	sq. yds. granite block pavement without foundation	27.90
11,020.77	sq. yds. granite recut and replaced	34,164.39
862.81	sq. yds. creosote block pavement	3,710.09
24,259.35	lin. ft. stone curb	27,208.90
35,316.25	lin. ft. stone curb reset	6,471.36
3,512.85	lin. ft. radius curb	4,793.55
30,608.38	lin. ft. cement curb and gutter	19,763.11
718.10	lin. ft. cement curb	271.44
196.00	lin. ft. cement gutter	109.94
590.06	lin. ft. cement curb and gutter reset	153.65
946.50	lin. ft. cement curb removed	222.40
144,498.42	sq. ft. cement walk	23,248.58
	Patching cement walk	330.05
2,922.72	sq. ft. cement walk removed	435.41
81.00	sq. ft. cement walk reset	16.20
246.28	sq. ft. cement driveway	61.57
1,461.03	sq. yds. sodding	233.76
		$767,655.53

ALLEY IMPROVEMENTS

33,298.00	cu. yds. of excavating	$ 34,138.38
2,291.00	cu. yds. of filling	1,559.08
1,806.86	sq. yds. bituminous concrete pavement	3,280.14
287.30	sq. yds. brick pavement	922.08
140,458.11	sq. yds. cement concrete pavement	222,725.73
19,104.82	sq. yds. cobblestone removed	6,018.99
1,436.72	sq. yds. old pavement removed	499.50

2,884.40 sq. yds. granite block pavement	11,179.54
2,884.40 sq. yds. granite block pavement removed	1,105.80
721.81 sq. yds. concrete pavement removed	288.72
37.48 sq. yds. brick pavement relaid	37.48
2.00 lin. ft. radius curb	3.00
10.80 lin. ft. stone curb	12.24
39.55 lin ft. stone curb reset	7.91
9.80 lin. ft. cement curb	6.56
20.50 lin. ft. cement curb removed	8.20
153.30 sq. ft. cement walk	35.63
130.20 sq. ft. cement walk reset	26.04
134.10 sq. ft. cement walk removed	26.82
	$281,881.84

WORK DONE BY CITY CREWS

Cement walks	89,956.75 sq. ft.	
Cement driveway	1,876.25 sq. ft.	
Cement walk reset	2,545.85 sq. ft.	
Cement curb	336.65 lin. ft.	
Cement curb and gutter	1,489.95 lin. ft.	
Cement steps	57.50 lin. ft.	
		$20,369.96
GRAND TOTAL		$1,069,907.33

Table showing miles of the various pavements taken up and laid during the year 1919 and the total miles of paved streets at the end of the years 1918 and 1919:

Kind of Pavement	Miles taken up during 1919	Miles laid during 1919	Total Miles at end of 1918	Total Miles at end of 1919
Asphalt	0.38087	8.48691	129.06755	137.17359
Brick	0.16098	0.12784	23.22867	23.19553
Granite Block	0.	0.16098	11.86408	12.02506
Sandstone Block	0.	0.46086	10.37314	10.83400
Creosote Wood Block	0.	0.06383	11.59970	11.66353
Bituminous Concrete	0.	0.25492	10.09073	10.34565
Cement Concrete	0.	0.	0.99601	0.99601
TOTAL	0.54185	9.55534	197.21988	206.23337
Macadam	5.58570	0.	230.64458	225.05888
GRAND TOTAL	6.12755	9.55534	427.86446	431.29225

MILES OF ALLEY PAVEMENT

Total length of alleys paved during 1919	14.30720 miles
Total length of alley pavement removed during 1919	1.98453 miles
	12.32267 miles
Total length of alleys paved at the end of 1918	136.16687 miles
Total length of alleys paved at the end of 1919	148.48954 miles

At the end of the year 1919 there were 494.43 miles of streets within the city limits of which 431.29 miles are improved and 63.14 miles are unimproved.

LENGTH OF STREETS

At the end of the year 1918 the total length of streets in the city of Milwaukee amounted to 492.70 miles.

During the year 1919 there were added:

By platting	0.93 miles
By condemnation	1.27 miles
By dedication	0. miles
	2.20 miles
Minus vacations	0.47 miles
Total of new streets	1.73 miles
Total at the end of 1918	492.70 miles
Total at the end of 1919	494.43 miles

WATER PIPE

Plans and profiles were made, line and grade given for laying 12,924 feet, or 2.4477 miles of water pipe, of sizes ranging from four to sixteen inches in diameter, as follows:

293	lineal feet of 4 inch pipe
9,180	lineal feet of 6 inch pipe
234	lineal feet of 6 inch hydrant pipe
2,629	lineal feet of 12 inch pipe
476	lineal feet of 16 inch pipe
12,924	feet

A complete report of the costs of the laying of water pipe, etc., will be found in the report of the Supt. of Water Works and Water Purification.

VACATIONS AND CONDEMNATIONS OF LAND

Maps and descriptions of lands proposed to be condemned for highway or other purposes were made, also for the vacations of streets and alleys, as follows:

CONDEMNATIONS

	Ward
Alley between Concordia Ave., Townsend Street, 21st Street and 22nd Street	20
Atkinson Ave., from Green Bay Ave. to Lake Street	25
Townsend Street, from Hopkins Street to 27th Street	20
Lots 5 and 6, Block 20, Lake Side Park No. 3	17
Schiller Street, from Franklin Street to Lake Street	21
Holton Street, from Keefe Ave. to Becker Ave	21
Franklin Street, from Humboldt Ave. to Richards Street	21
Bremen Street, from Keefe Ave. to Franklin Street	21
Lands for park purposes between 11th and 14th Ave. and North of Cleveland Ave.	24
Lots 1, 2 and 3, Block 57	4
Lots 6, 7 and 8, Block 48	3
Lots 18, 19, 20 and 21, Block 2, Hopkins and Hadley's Subdivision No. 1	14
6th Street, from Green Bay Ave. to Lake Street	21
Townsend Street, from 35th Street to Easterly Right-of-Way of C. M. & St. Paul Railway	20
Alleys in Block 14, Dickerman's Subdivision	9
Alley running North and South, between 12th, 13th, Vine and Sherman Sts	10
Lots 1 to 5 inclusive, Block 1, Minnie Park	19
Block 2, Schwartz's Subdivision	25
Lots 1 to 9, Block 7, Mrs. Z. W. Estes' Subdivision and Lots 20 to 38, Block 1, Lindsay's Subdivision	17
21st Street from Teutonia Ave. to Lake Street	25
10th Street from Graham Street to Atkinson Ave	25
Rogers Street from 11th Ave. to Forest Home Ave	11 and 24

VACATIONS

Southeasterly ½ of alley in Block 2, West Park Subdivision	19
Keefe Ave. from 27th Street to 28th Street	20
28th Street, from Townsend Street to Keefe Ave	20
All alleys in Block 12, Continuation of Grand View	20
East and West alley, Block 6, Fond du Lac Ave. Addition	20
Alley Block 32	2
East 5 feet and West 5 feet of North and South alley, Block 6, Grand View	20
North and South alley between Weil, Bremen, Auer and Concordia Ave	21
Ship Street from Commerce Street to Green Bay—Water Power Canal	6
East 10 feet and West 10 feet of Layton Place	24

The following street names were changed during the year, 1919:

Tomah Street Changed to Vine Street_____9th Ward
Paradise Alley changed to Tomah Lane_____9th Ward

AREA OF CITY, January 1st, 1920—25.85 square miles.

Land—25.332 square miles; Water—0.518 square miles.

The area of the city January 1st, 1900_____21.15 square miles
The area of the city January 1st, 1905_____22.37 square miles
The area of the city January 1st, 1910_____22.63 square miles
The area of the city January 1st, 1915_____25.72 square miles
The area of the city January 1st, 1916_____25.85 square miles
The area of the city January 1st, 1917_____25.85 square miles
The area of the city January 1st, 1918_____25.85 square miles
The area of the city January 1st, 1919_____25.85 square miles

SEWERS

Contracts for work completed during the year included 34,241 lineal feet of 8, 12, 15, 18, 20, 21 and 22 inch cement or clay pipe sewers; 4,788 lineal feet of 24, 27, 30, 33, 36, 39, 42, 54 and 60 inch reinforced concrete pipe sewers.

The Sewer Department, in addition to the flushing and cleaning of sewers, repairs to and setting to grade of manholes, built 84 manholes and 783 catch basins during the year. In addition to the sewers laid and accepted during the year 1919, amounting to 7.781 miles at a cost of $102,882.00, there were laid 1067 lineal feet of 8 inch pipe sewer, 7,935 lineal feet of 12 inch pipe, 68 lineal feet of 18 inch pipe and 515 lineal feet of 24 inch pipe, and 466 lineal feet of 30 inch pipe sewers by the Bureau of Sewers.

Up to the end of 1918 there were built 513.293 miles of sewer at a cost of $7,643,645.98, making at the end of 1919, a total of 522.889 miles at a cost of $7,769,397.90.

The total length of sewers, including intercepting sewers, constructed by the city of Milwaukee up to the end of the year 1919, was 556.49 miles, as follows:

8.716 miles of 8 and 10 inch pipe
188.988 miles of 12 inch pipe
178.379 miles of 15 and 18 inch pipe
1.622 miles of 20, 21 and 22 inch pipe
1.993 miles of 24 inch reinforced concrete pipe
0.923 miles of 27 inch reinforced concrete pipe
1.869 miles of 30 inch reinforced concrete pipe
1.527 miles of 33, 36 and 39 inch reinforced concrete pipe

0.535 miles of 42, 45 and 48 inch reinforced concrete pipe
0.341 miles of 54 and 60 inch reinforced concrete pipe
14.083 miles of 24 inch brick
42.926 miles of 30 inch brick or monolithic concrete
19.217 miles of 36 inch brick or monolithic concrete
9.689 miles of 42 inch brick or monolithic concrete
8.994 miles of 48 inch brick or monolithic concrete
5.495 miles of 54 inch brick or monolithic concrete
6.503 miles of 60 inch brick or monolithic concrete
4.220 miles of 66 inch brick or monolithic concrete
6.458 miles of 72 inch brick or monolithic concrete
2.465 miles of 78 inch brick or monolithic concrete
2.754 miles of 84 inch brick or monolithic concrete
0.125 miles of 90 inch brick or monolithic concrete
3.397 miles of 96 inch brick or monolithic concrete
2.718 miles of 120 inch brick or monolithic concrete
33.6 miles of intercepting sewers (including intercepters built by Sewerage Commission.)

The largest diameter of sewer built is 120 inch and the smallest diameter is 8 inch. There are 89 outlets for sewers into Milwaukee, Menomonee and Kinnickinnic rivers and four outlets into Lake Michigan. These sewers have 24,150 manholes and 25,837 catch basins; there are also 79,232 house drains connected with the sewers and 703 storm drains. All work completed during the year, including laying of sewers, water pipe, house drains and water service, has been entered on the proper departmental records.

ESTIMATING DEPARTMENT

Prepared estimates for improving streets and alleys	246
Prepared ordinances for establishing grades on alleys	85
Prepared ordinances for establishing grades on streets	45
Prepared ordinances for establishing width of sidewalks	13
Prepared ordinances for establishing grade of sidewalks	3
Prepared profiles for establishing grades	151
Prepared sketches and plans for street and alley improvements	492
Prepared plans for house drains and water service	38
Issued certificates for street and alley improvements	206

Annual Report

of

Bureau of Plumbing

During Year Ending

December 31, 1919

STAGE OF WATER IN RIVERS AND LAKE DURING 1919

	Highest	Lowest	Mean
January	—0.1	—0.5	—0.317
February	+0.2	—0.9	—0.287
March	+0.2	—0.6	—0.186
April	+0.3	—0.4	—0.156
May	+0.7	—0.3	+0.256
June	+0.7	+0.2	+0.333
July	+0.4	—0.3	+0.117
August	+0.5	—.07	—0.143
September	—0.3	—0.9	—0.707
October	—0.2	—1.2	—0.729
November	—0.5	—1.3	—0.915
December	—0.8	—1.9	—1.344

Highest	+0.7
Lowest	—1.9
Average Mean	—0.3398

	Highest	Lowest	Mean
1919	-|-0.7	—1.9	—0.3398
1918	+1.3	—0.6	-|-0.173
1917	-|-3.0	—0.8	-|-0.0864
1916	-|-.0.4	—1.1	—0.349
1915	0.0	—1.2	—0.6105
1914	-|-0.2	—1.5	—0.489
1913	-|-0.3	—1.5	—0.6119
1912	-|-1.7	—2.9	—0.7939
1911	—0.6	—2.9	—1.809
1910	—0.3	—2.6	—1.497
1909	-|-0.8	—3.0	—0.242
1908	—1.1	—1.5	—0.482
1907	-|-1.0	—1.1	-|-0.960
1906	-|-1.1	—0.9	-|-0.070
1905	-|-1.0	—1.2	—0.020
1904	-|-1.5	—1.36	—0.140
1903	-|-0.23	—1.73	—0.660
1902	0.0	—2.2	—1.010
1901	-|-0.4	—1.9	—1.690
1900	—1.1	—2.3	—0.940
1899	-|-0.4	—2.2	—0.900
1898	0.0	—2.7	—0.980
1897	—0.1	—2.3	—1.160
1896	—0.1	—2.8	—1.810

THE LINWOOD AVENUE TUNNEL

The year 1919 saw the final completion of the Linwood Avenu Intake into Lake Michigan. The extension of the intake tunnel an the lake shaft were completed during 1918, leaving the work o grading the stone of the submerged intake crib and the placing o the screen to the season of 1919.

The crib was relocated by sounding from a tug aided by rang lines given by the engineers from the shore, because the storms o the preceding winter had torn loose all the buoys and anchors se at the end of the previous season's work. The crib was located an work commenced on June 9th, 1919. Rough weather interfere materially with the rapid conclusion of the work. The contractor' crew for the work consisted of a superintendent, a tug crew of fou men, a diver and a diver's helper, and two laborers for the air pump Later on this crew was augmented by the addition of another diver

The temporary "spider" crib, consisting of two courses of 12″x12 timbers built to same plan as the main submerged crib, was firs removed, then the segments of the wood caisson and the clay packing in back of the caisson around the shaft opening. The caisson and clay packing had been used in the operations of constructing the lake shaft.

About ten yards of the clay were taken out altogether. The stone within the partitions of the crib was graded to conform to the required slope and additional stone placed upon the outside of the crib as protective rip-rapping. The lake currents at this spot sometimes attained a velocity sufficient to take the divers off their feet. The grading of the stone about the crib was completed and inspected by the City's diver on August 17th, 1919, who reported that the work was satisfactorily done. They also reported that several 12″x12″ timbers forming the top of the submerged crib were broken and that the crib timbers along the sides needed repairing before placing the timber screen. The damage was no doubt due to the rocking and sliding of the heavy steel working crib upon the submerged crib during the heavy seas of the storm of September, 1917, which wrecked the working shaft and caused operations to cease for the season. The repairs were made and the entire submerged crib cleaned of all debris, leaving the work ready for the setting of the screen.

The screen is 62 feet in short diameter and consists of 8 outer sections and 1 inner section covering the octagonal shaped crib, and was composed of 2″x12″ fir boards spaced 2″ apart on edge with cast iron washers, and rigidly held together with longitudinal and transverse rods of 1¼″ diameter. The actual net area of screen opening is about 1250 sq. ft., being about 11.0 times the area of the intake shaft which is 12 feet in diameter, giving a maximum approach velocity of about 0.27 feet per second. The crib was

again inspected August 27, 1919 by the City's diver, after the repairs had been made, and permission given the contractor to place the screen upon the crib. On September 7, 1919 the contractor completed the work of assembling the screen and bolting it to the top of the submerged crib. The work was satisfactorily done, as shown by inspection of September 10, 1919, and it is now ready for acceptance by the City.

EXPERIMENTAL FILTER PLANT.

The experimental filter plant was completely equipped and operations begun during February, 1919. The investigations were made to determine the necessity of filtering the water supply and, if so, what method or methods would be most economical.

The experimental filter plant is located upon the grounds of the North Point Pumping Station, immediately north of the Chemical Laboratory. Water is obtained from the gatewell of the Shore Tunnel of the new Linwood Avenue Intake System, and is pumped into the storage tank of the filter building by a steam pump set in a pit alongside the Chemical Laboratory.

The building housing the experimental apparatus is of frame construction 40'x70' outside dimensions and three stories in height, which includes the tower. On the third floor are the raw water, wash water and equalizing tanks, with a 4" meter to measure the raw water used. The second floor contains the chemical mixing tanks and a scale for weighing the chemicals. The first floor contains the various mixing devices used to mix the chemicals with the raw lake water, also the settling basin, two rapid sand filters of 1-1000th acre area each, two weir boxes with "V" notch weirs for controlling the rates of filtration, ozoning and chlorinating apparatus, together with the necessary electrical and mechanical equipment for operating the plant.

The chemicals used in filtering the water were aluminum sulphate (alum) and a mixture of lime and ferric sulphate. Various tests were made of each mixing device to determine their relative efficiency as floc formers at different rates of filtration. The effective size of the filter sand was also varied to determine the maximum rates of filtration permissable with the lake water. The filtered water was examined both untreated and when treated with chlorine solution or with ozonized air.

During the operations of the experimental filter station, the following organization was employed. The consulting engineer who spent alternate weeks at the plant and was responsible for the entire experiments, including the plans, operations and submission of progress reports from time to time; the chemist, in charge of the plant operation and the chemical analyses, the bacteriologist in charge of all bacteriological work; three filter attendants, and two

helpers in the chemical and bacteriological work. The above does not include the services of the regular chemist of the water department, who makes daily examinations of the lake water and is in charge of the operation of chlorination of the city's water supply.

Miscellaneous services of the engineering division of the water department were required from time to time, as in the construction of the building and all apparatus, tests of the measuring devices, etc.

The results of the year's investigations will be made public in a report by Mr. Jos. W. Eilms of Cleveland, Ohio, Consulting Engineer in charge of the investigations in behalf of the city. It is expected that the report will be ready in printed form about May 1, 1920.

FILTRATION PLANT.

The site for the proposed filtration plant to filter the entire water supply of the city was definitely decided upon as the area adjacent to the Shore Shaft of the present Linwood Avenue Intake. This location will require the construction of a sea-wall to protect the works, but it is expected that the construction of the proposed Lake Shore Drive along the shore of Lake Michigan will further protect the site by extending the reclaimed area with the consequent building of a permanent breakwater along the lake side of the land thus reclaimed.

The first step in the reclaiming of the land required for the filter plant site will be the building of the breakwater. Plans have been made and a permit is now being requested of the U. S. Government for permission to fill in the area required.

During the year 1919, various steps were taken to finance the proposed filter plant but so far none has been successful. An estimate of the cost of the filter plant with a capacity of 160,000,000 gallons per day was made to determine the amount of money required to be raised. The estimated cost was about $4,500,000.

LINWOOD AVENUE TUNNEL

The Linwood Avenue Intake System, as planned during the year 1912, is now nearing completion. The remaining water supply tunnel, the Linwood Avenue Tunnel, is now under construction and will be completed within the next eighteen months. The tunnel lies in and along Linwood Avenue from the Shore Shaft of the present Linwood Avenue Intake Tunnel to the site of the proposed Riverside Pumping Station on the west side of the Milwaukee River.

The tunnel is of circular cross-section, 9 feet in diameter with a wall thickness of 12 inches. The total length of the main tunnel and the branches at either end is approximately 7336 feet. At the

Shore Shaft of the present Intake Tunnel, a reinforced concrete bell-mouth will connect the "Y" branch leading to the proposed connection with the future filter plant, with the main tunnel. The "Y" branch will be equipped with a 9 foot circular sluice gate, hand operated, and set in a gate-well. The west end of the tunnel will terminate at a gate-well on the site of the proposed Riverside Pumping Station. From the gate-well the tunnel will extend westerly about 78 feet and then divide into three branches which will lead to the suction wells of the proposed pumping station. The grade of the tunnel will be on a uniform slope of about 0.171 per cent, with the invert elevation at the lake end of —20.00 and at the west end of —32.00.

The elevation of the invert of the suction wells will be —21.00. The material through which the tunnel will be driven consists largely of hardpan with some sandy clay, boulders and gravel.

Bids on the construction of the tunnel were received on November 7th, 1919, and were as follows:

Bidder	Gatewell per lin. ft. (83 ft. total)	Tunnel per lin. ft. (7336 ft. total)	Total Bid
Herman Hohensee, City	$400.00	$66.97	$524,491.92
Wenzel & Henoch Co., City	147.00	76.25	571,571.00
Greiling Bros. Co., Green Bay, Wis.	450.00	97.50	752,610.00
Deeks & Smith, St. Paul, Minn	347.00	134.00	1,011,825.00
Green & Sons Co., Chicago, Ill	500.00	150.00	1,141,900.00
Alb. H. Prange, City	154.00	154.00	1,142,526.00

A price of $6.00 per barrel of Portland cement when used for grouting was set by the city for all grouting done behind the tunnel lining. In addition to the prices bid on the tunnel, the contractor will receive an extra payment for all work done under air pressure, varying from $8.00 per lineal foot when the pressure is from 15 pounds to 20 pounds per square inch, to $15.00 per lineal foot when the pressure exceeds 30 pounds per square inch.

The contract was awarded to Herman Hohensee on his bid of $524,491.92.

Actual construction work was begun at the temporary shaft at Oakland Avenue and Linwood Avenue on December 27, 1919. A second temporary shaft in Lake Park near Lake Drive will soon be dug.

REED STREET WATER PIPE TUNNEL.

The original main feeder of the water distribution system supplying the South Side of the city and including most of the industrial district of the Menomonee Valley, was carried across the

Menomonee River in a trench. The growth of shipping on the Great Lakes has necessitated the deepening of our rivers from time to time, and because of this fact and that large steamers which dock upon this river are frequently fouling the submerged water pipe at this crossing and endangering the supply, it was decided to abandon the former river crossing and build a tunnel to carry the water pipe. Plans for the tunnel were made in 1918, but actual construction was held up because of the late war's restrictions on building construction.

The crossing as planned and constructed consists of extending easterly through the freight yards of the Chicago, Milwaukee & St. Paul Railway Co., the present 20-inch diameter cast iron pipe line in Third Street south of Fowler Street; entering the north shaft of the tunnel on the west side of West Water Street about 40 feet north of the Menomonee River; crossing the river in tunnel about 40 feet below the river bottom and west of the bascule bridge at this point; thence thru the south shaft of the tunnel on the west side of Reed Street and thence southerly to connect with the present 20-inch water main which extended westerly in Point Street, now vacated. That portion of the original pipe crossing not used will be abandoned.

The tunnel is 282 feet long from center to center of shafts, the elevation of the bottoms of the north and south shafts are respectively —69 and —71 with a 3-foot sump in the south shaft for drainage. The shafts are 10 feet in diameter, with 12-inch plain concrete walls, each shaft encased in a steel caisson composed of steel plates ⅜" thick, built in 6-foot sections stiffened with steel angles at each end.

The tunnel has a circular top with straight sides and flat bottom, being 9 feet in width and 6 feet, 10½ inches in height, with a 12-inch crown thickness, 18-inch side walls and 20-inch bottom. The side walls and bottom are reinforced longitudinally and transversely with plain steel bars of ¾-inch diameter. Shaft bottoms are 2 feet thick and reinforced.

The water pipe entering the shafts and tunnel was made 24-inch diameter to reduce the pipe friction. Standard lugged fittings were used on the pipe in the shafts, and the pipes were further attached to the sides of the shaft by steel clamps held in place with anchor bolts into the shaft walls.

Large steel tension plates were used at the top of the shafts where the water pipe entered and left the shafts. In the tunnel the pipes are supported on concrete cradles, placed one under each pipe near the bell end. The base curves at the bottom of each shaft were solidly concreted in place. The solid concrete backing of the curves in the shaft bottom and the heavy tension plates to hold the pipe at the top of the shaft will prevent the parting of the main at these points due to water pressure. This is the first water pipe

crossing in tunnel where any provision has been made to prevent the pipe line parting at the curves. The not infrequent breaking of the pipe lines in other tunnels crossing the several rivers of the city demanded that the condition be remedied. It is not anticipated that such trouble will occur with the pipe line in this crossing.

Some delay was occasioned by the inability of bidders to qualify after bids on the construction of the tunnel and the pipe line were called for in December, 1918. Bids were advertised three times and the net result was an increased cost to the city of about $9,000.00. The results of advertising for bids the third time were as follows:

Bidder	Price Per Lineal Foot.				Total of Bid
	Shafts (181′)	Tunnel (268′)	20″ Pipe in Trench (765′)	24″ Pipe in Tunnel (440′)	
Geo. E. Zimmerman	$280.00	$100.00	$11.00	$10.00	$90,295.00
W. E. R. Const. Co	324.00	85.00	8.00	8.00	91,064.00
Alb. H. Prange	300.00	100.00	10.00	10.00	93,150.00
Herm. Hohensee	273.00	112.00	7.00	11.00	89,624.00
F. H. Nakielski	295.00	81.50	12.00	12.00	89,697.00
Engineer's Estimate	255.36	145.03	4.73	4.16	91,190.00
Profit					24.4%

In addition to the above prices, the Contractor will receive $4.00 per barrel of Portland Cement used in grouting.

The contract was awarded to H. Hohensee on his bid of $89,624.00, and actual construction was started on the south shaft on May 27, 1919.

A 16′x16′ square shaft was dug about 10 feet deep and heavily braced with 12″x12″ timbers. Within this pit, the 6-foot steel sections of the caisson were assembled and the concrete lining placed the sinking of the shaft proceeding with the excavating and concreting operations. The shaft was hand-excavated to a depth of 89 feet, the caisson meanwhile sinking of its own weight. From this point all excavation was done under water with a clam shell until a depth of 100 feet had been reached.

The concrete slab in the bottom of the shaft was placed under water, being made 6.5 feet thick and reinforced. This was done July 29th, 1919, or about two months after construction was begun.

The shaft was then pumped out and grouted its entire length. On cutting out the tunnel "eye" it was ascertained that the outside pressure was about 40 pounds per square inch. The shaft was then equipped with both a material and a man air-lock located above datum and the work carried on under an air pressure of 40 pounds.

However, the heavy pressure soon disabled the men and it was decided to raise the elevation of the entire tunnel 10 feet. This change was made and the shaft bottom filled with solid concrete to the new grade, the eye cut out and a 6'x7' box drift started in the tunnel on September 25, 1919.

After being driven 14 feet, the drift was widened to the specified tunnel cross-section and an 8-foot section concreted. The tunnel was then driven from the south shaft to the north shaft under air pressure varying from 21 to 28 pounds per square inch, at a rate of progress of from 2 to 7 feet per day of completed tunnel. Placing of the concrete followed closely to the excavation heading, the maximum distance between concrete and heading being 12 feet. The tunnel was connected to the north shaft on December 9th, 1919.

The construction of the north shaft was commenced August 6th 1919, and using the same method of procedure as with the south shaft, the caisson of the north shaft was sunk to final position on November 7th, 1919. A slab 5.5 feet thick was placed in the bottom of the shaft, and the entire length of the shaft grouted.

During the period of sinking both caissons, a diver was employed to remove boulders and other obstructions lodged under the cutting edges of the caissons, and which could not be removed by the clam shell. The bottom of the south shaft rests upon sandy red clay while that of the north shaft rests in hard red clay. After the caissons had ceased to sink by their own weight, additional weight in the shape of bars of pig iron placed on a platform on top of the caissons was used to facilitate further sinking. The north shaft required a maximum weight of 359 tons of pig iron while the south shaft required a maximum weight of 244 tons of pig iron to sink it to final position.

The excavation of the tunnel proper was 9.5 feet high and 12 feet wide. The material encountered consisted of hard red clay with some sandy red clay. The top 8 to 15 inches of the heading was composed of gravel necessitating forepoling and packing with hay to prevent runs from the roof. On account of the presence of the gravel above the roof of the tunnel, it was difficult to hold the air pressure in the tunnel, and grouting behind the tunnel lining had to be resorted to in order to check the loss of air through the gravel stratum. The grout consisted of a mixture of neat cement, some bran and water, and was forced in with a hand pump. It is interesting to note, in connection with the loss of air from the tunnel, that large volumes of air made their escape from the substrata at various points along the river as far distant as the Buffalo Street bridge on the north and in the South Menomonee River near Bagnall's Slip, distant respectively 900 feet and 750 feet from the work.

The air pressure in the tunnel was finally taken off on December 9th, 1919, and the entire tunnel grouted, using air pressure to operate the grouting machine. The air locks were then removed and

the water pipe placed in the tunnel. Most of the 765 lineal feet of 20" diameter water pipe in trench had been laid while construction of the tunnel and shafts was going on. While the entire work had not been completed to the end of the year 1919, it is expected that the work will not extend beyond the middle of February, 1920. The placing of this water main again into active service will relieve the East Water Street and the Muskego Avenue water pipe crossings of some of their load and tend to maintain a satisfactory water service in the congested Menomonee Valley factory district.

MISCELLANEOUS ACTIVITIES.

The Engineering Division has in course of preparation designs for the extension of the water pipe distribution system to provide for the needs of the city to the year 1950. The plans will later be submitted to the State Board of Health for their approval, in compliance with a recent State law to that effect.

The site of the future Riverside Pumping Station on the west side of the Milwaukee River east of Chambers Street was surveyed, cross-section and permanent concrete monuments set upon the property lines.

Miscellaneous surveys, estimates, plans and reports were made during the year concerning the water works and for the City Engineer's Department. The amount and variety of the work done by the Engineering Division of the Water Department is considerable whereas the personnel consisted of but one designing and one construction engineer, one draftsman and another assistant for a greater portion of the year, 1919.

DAKOTA STREET SEWER TUNNEL EXTENSION

In order to provide adequate drainage for an area West of American Avenue and South of the Chicago & Northwestern Railway tracks, which area will in the near future be included in the City limits, and in order to eliminate the stench caused by the Kinnickinnic River, it was decided early in the year to extend the Dakota Street Sewer tunnel southwesterly.

Plans were drawn and specifications prepared for an extension of 1,522 lineal feet South and West from Dakota Street and American Avenue, the present terminus of the tunnel, to 13th Avenue and Manitoba Street. These plans comprised a 6½-foot internal diameter concrete lined sewer tunnel, together with a concrete catch-basin and a dam to conduct the dry weather flow of the river into this tunnel.

The following is a schedule of bids received for the construc tion of this tunnel:

Bidder	Tunnel per lin. ft. (1522 ft. total	Manholes	Revetment wall, 75 ft. concrete pipe sewer and dam	Total Bid
Wenzel & Henoch Co	$47.50	$37.00	$1,140.00	$77,653.0(
Nakielski, F	55.00	45.00	12.00	88,852.0(
Prange, W. H	54.50	54.50	2,300.00	91,462.0(
Hohensee, H	60.00	100.00	150.00	102,870.0(
Zimmerman, Geo	59.00	65.00	45.00	97,253.0(

The Wenzel & Henoch Company, being the lowest bidders, was awarded the contract for its construction, April 14th. Work was soon started, a shaft was sunk at American Avenue and Manitoba Street, and the headings driven both ways from this shaft.

Due to the nature of the ground and other unavoidable delays, it was impossible to complete the tunnel this year. At present, however, the work is about 83 per cent. done and is in good progress. About March 1st will see its completion.

RIVER SURVEY.

After the period in which the war occurred, during which time the River Survey party ceased to exist and all work which was done by the party was dropped, the River Survey party started on the first of the year to resume its work.

There was only one man on the party until February 15th, when two more men were engaged. The condemnation work, computations, the maps and the descriptions of Jones Island from the north line of the old harbor entrance to Wilcox street, required nearly six months' time as the party had to retrace considerable field work which could not be used due to the original points being lost during the war period. All of the engineering work for the condemnation for this land has been completed and the maps and descriptions of all the parcels of land turned over to the Harbor Commission.

The Harbor Commission engaged the services of Consulting Engineer McL. Harding of New York. He was supplied with all the information, maps and surveys upon which to base his plans for the outer

Harbor improvements. In order to give him this, it was necessary to make several large surveys, such as getting soundings of the bottom of the lake for an area one mile long and 1500 feet out into Lake Michigan.

Ordinances have been drawn up, changing numerous dock lines, the longest of these being the dock line from the Harbor entrance around the Kinnickinnic basin to the Chicago & Northwestern Railroad bridge. This dock line is approximately 9600 feet long and required considerable work in the field.

This class of work required lengthy computation and as it was revised several times, it required a formidable portion of time.

Numerous dock lines were staked out for construction work and with one or two exceptions, these were small jobs taking from 3 to 10 days. There were also a great many dock lines given for work which was never built.

The triangulation survey of the Kinnickinnic River which had been started in 1916 was carried on to the south end which is the Chicago Road. All the field work with the exception of the work of tying in to street corners, has been completed and considerable computations finished.

The Harbor Commission has requested this department to draw up the requests for permits from the Government to fill in the lake. These permits require several tracings of the location and detail of the work and must be figured from the shore work.

All the work above mentioned was interwoven and several jobs were carried on during the same time.

The usual information pertaining to river work was given out during the year.

SEPARATION OF GRADES—STEAM RAILROADS.

During the year 1919, no construction work was done on the physical separation of the grades of the streets crossing the Chicago & Northwestern Railway, Madison Division, on the southwest side of the City, the Chicago, Milwaukee & St. Paul Railway, Northern Division, on the northwest side and the Chestnut Street Line (Beer Line) of the Chicago, Milwaukee & St. Paul Railway on the north side of the City.

Orders to commence construction by May 1, 1919, had been given the respective railroads by the Wisconsin State Railroad Commission, but the work was again held in abeyance due to the fact that Congress, in its appropriation for expenses of the U. S. Railroad Administration, had failed to provide the necessary funds for the carrying out of the above project.

It is to be hoped that the return of the railroads to private ownership will enable the work of actual construction to be undertaken this coming year of 1920, as the traffic conditions which necessitate the above elimination of grade crossings have become more burdensome with the steady and rapid growth of the City.

FINANCIAL.

BUREAU OF ENGINEERS—GENERAL OFFICE

Budget Appropriation	$5,202.00

EXPENDITURES

Personal Service—Permanent	$4,615.00
Office Supplies	99.77
Minor Repairs	7.70
Postage	25.00
General Service	19.59
Official Bond	25.00
Office Equipment	70.46
Total	$4,862.52
Unexpended balance	339.48
	$5,202.00

BUREAU OF ENGINEERS—ENGINEERING DIVISION

Budget Appropriation	$49,478.00

EXPENDITURES

Personal Service—Permanent	$39,405.13
Personal Service—Temporary	2,572.30
Office Supplies	303.04
General Supplies	873.24
Minor Apparatus	184.70
Tools	4.28
General Materials	83.25
Minor Repairs	23.71
Municipal Garage Service	2,283.45
Postage	15.00
Storage of Vehicles	223.00
Street Car Fare	100.00
General Service	343.59
Office Equipment	195.98
General Equipment	290.00
Total	$46,900.67
Unexpended balance	2,577.33
	$49,478.00

RECAPITULATION

	Budget	Expenditures	Balance
General Office	$5,202.00	$4,862.52	$ 339.48
Engineering Division	49,478.00	46,900.67	2,577.33
Totals	$54,680.00	$51,763.19	$2,916.81
Service Vouchers—Engineering Division			951.01
	$54,680.00	$51,763.19	$3,867.82

All members of this department who were in the Army or Navy Service during the late war have returned to their respective positions.

I desire to express my appreciation to the employes of the department for faithful and diligent performance of their duties during the past year.

Respectfully submitted,

GEORGE F. STAAL,
City Engineer.

Annual Report

of

Bureau of Power Plants Flushing Stations

For the Year

1919

THOMAS McMILLAN,
Chief Engineer of Power Plants

January 24th, 1920.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

Reports of operation of the several Power Plants for the year ending December 31st, 1919 are herewith submitted:

MILWAUKEE REFUSE INCINERATOR

Joseph E. Roddy, Superintendent.

During the year no power was purchased from the Electric Company to operate the Milwaukee River Flushing Plant, and the river was kept in a good sanitary condition during the summer months; no complaints being made.

This result was obtained by adding an extended furnace to a second boiler in the early part of the year, to fire fuel direct to boilers when garbage and ashes were inadequate to supply the necessary steam, the additional cost of coal to obtain results being much less than purchased power.

TOTAL COST OF OPERATION

GARBAGE AND MIXED REFUSE INCINERATED

Year	Total tons mixed refuse incinerated	Total cost including equipment	Total Cost of equipment	Total Cost of operation only	Cost per ton
1911	50,803.39	$57,419.47	$4,056.45	$53,363.02	$1.05
1912	48,413.32	56,760.51	3,580.74	53,179.77	1.10
1913	53,581.02	66,147.30	4,269.31	61,877.99	1.15
1914	54,684.15	67,892.43	1,365.48	66,526.95	1.22
1915	58,043.10	66,812.56	3,695.40	63,117.16	1.09
1916	54,275.36	67,613.10	3,374.64	64,238.46	1.1835
1917	46,979.97	75,921.82	3,842.75	72,079.07	1.534
1918	45,457.58	81,797.80	750.20	81,047.60	1.7837
1919	42,202.26	103,742.78	925.95	102,816.83	2.4362

STATEMENT SHOWING TOTAL REFUSE INCINERATED, CITY AND PRIVATE COLLECTIONS DURING 1919, AND FEED WATER PUMPED TO BOILERS

Month	Total hours operated	Total pounds mixed refuse incinerated	Cubic ft. of water to boilers	Temp. of water to boilers	Average Lbs. of water per hour to Boilers	Aver. Evap. per lb. of mixed refuse
January	664	6,622,900	68,090	180	4,124,892	1.605
February	608	5,139,760	63,992	180	3,876,635	1.325
March	664	6,080,540	71,704	180	4,343,828	1.399
April	656	5,704,240	79,328	180	4,805,690	1.186
May	660	6,204,660	91,355	180	5,534,286	1.121
June	640	7,255,140	103,050	180	6,242,760	1.162
July	688	8,242,960	116,640	180	7,066,051	1.166
August	664	8,700,160	111,952	180	6,782,052	1.282
September	656	8,765,400	102,702	180	6,221,687	1.408
October	680	8,263,340	101,966	180	6,177,100	1.345
November	624	6,707,780	78,850	180	4,776,733	1.404
December	656	6,717,640	71,054	180	4,304,452	1.560
Totals	7,860	84,404,520	1,060,683	180	64,256,166	1.315

Average percentage of refuse incinerated during 1919: Garbage, 77.051 per cent; ashes, 18.710 per cent; rubbish, 4.232 per cent; manure, 0.07 per cent.

INCINERATOR POWER PLANT—1919.

Thomas Coughlin—Engineer-in-Charge.

No change was made in the power plant equipment. The necessary examination and repairs were made during the early part of the year, and the machinery is now in good operating condition. The power delivered from the Incinerator Power Plant to operate the Milwaukee River Flushing Plant during 1919 was as follows:

Month	Total Hours Operated Flushing Station	Average K. W. Operating Flushing Station	Total K. W. H. Delivered to Flushing Station
January	-------	---------	-------
February	-------	---------	-------
March	-------	---------	-------
April	15.20	340	5,212
May	283.15	320	90,640
June	500.15	297.5	148,824
July	594.00	282.3	167,680
August	569.55	274.0	156,160
September	499.10	282.2	140,800
October	420.55	291.4	122,880
November	137.50	271.0	38,400
December	-------	---------	-------
Totals	3,020.40	294.8	870,590

MILWAUKEE RIVER FLUSHING STATION—1919.

David E. Camerson, Engineer in Charge.

Total hours in operation—flushing	2,983.10
Total K.W.H. delivered from Incinerator Plant	803,613
Total cubic feet of water displaced	7,293,457,798
Total gallons of water displaced	54,558,849,633
Average head of water in feet	2.762

Considerable repairs were necessary, to put the equipment in good operating condition. The motor having inadequate power to operate the wheel pump without overheating, the motor was rewound, the power being increased from 350 to 450 horse power. The face plate starter was renewed and plates increased in proportion to the power required. A new gear pinion was installed, and the large gear wheel recut, and put in proper adjustment. The equipment is now in good operating condition, only minor repairs being necessary.

KINNICKINNIC RIVER FLUSHING STATION—1919.

Ernest C. Eggebrecht—Engineer-in-Charge.

Total hours in operation	7,705.05
Total cubic feet of water displaced	11,755,232,200
Total gallons of water displaced	87,935,237,821
Average head of water in feet	2.297
Total coal consumed in pounds	2,593,250

During the early part of the year the wheel pit was pumped out; the wheel pump was examined, and found in good condition. Only minor repairs on the machinery and boilers were made, all moving parts were examined, and repairs made where necessary by the employees of the Plant.

The Kinnickinnic River was flushed and kept in good condition during the year; and the station as a whole is now in good operating condition.

JONES ISLAND PLANT—1919.

Joseph P. Rafenstein—Engineer-in-Charge.

As the experimental work is about completed by the Sewerage Commission, it is however necessary to keep the centrifugal pumps in operation continuously, to prevent the intercepting sewers from being clogged by the heavy material in the sewerage. The pumps and machinery at this plant are electrically driven, the power being purchased from T. M. E. R. & L. Co., the boilers being used for heating the buildings and adjuncts only. These boilers were placed in service in 1883, built for a pressure of 85 pounds per square inch, and should soon be removed, but will probably serve until the new boiler house is constructed.

The last boiler inspection certification on September 9th, 1919 reports that the boilers may be operated at a pressure not to exceed 65 pounds. The usual pressure used for heating is from 50 to 60 pounds for heating the premises. The boilers are in satisfactory condition considering age, and conditions under which they are operated.

Respectfully submitted,

THOMAS McMILLAN,
Chief Engineer of Power Plants.

FINANCIAL REPORT
BUREAU OF POWER PLANTS

	Incinerator Power Plant	Incinerator	Jones Island Plant	Kinnickinnic River Plant	Milwaukee River Plant	McKinley Park	Milwaukee River Dam	Totals
Personal Service—Permanent	$6,270.00	$87,022.96	$19,515.00	$16,805.00	$11,270.00	.....	.....	$140,882.96
Personal Service—Temporary	.....	.....	.....	104.16	.....	$1,806.80	$156.00	2,066.96
Botanical Supplies	.....	.....	.....	.....	.....	20.45	.....	20.45
Cleaning and Dis. Supplies	.....	13.22	25.93	16.86	12.25	.....	.....	68.26
Fuel	.....	8,294.93	1,532.86	7,204.06	270.13	.....	.....	17,101.98
Office Supplies	2.00	25.14	4.56	1.39	.....	.....	.....	33.09
General Supplies	88.51	1,132.16	119.78	376.93	118.45	5.26	.....	1,841.09
Minor Apparatus	.....	20.10	13.36	.....	.....	.....	.....	33.46
Tools	.....	134.12	2.90	2.21	1.23	4.76	.....	145.22
General Materials	546.27	613.61	25.20	37.33	46.89	518.88	27.20	1,815.38
General Repairs	.....	.....	.....	.....	5,204.67	.....	.....	5,204.67
Minor Repairs	399.33	2,271.93	.....	96.16	157.77	45.15	.....	2,970.34
Municipal Garage Service	.....	252.21	.....	159.65	.....	.....	.....	411.86
Team Hire	.....	.....	.....	.....	.....	504.00	.....	504.00
Telephone	.....	9.35	72.00	93.60	50.24	.....	.....	225.19
Water	.....	2,970.00	534.34	222.40	.....	300.19	.....	4,026.93
General Service	.....	57.10	5.00	15.00	35.56	.....	.....	112.66
Office Equipment	.....	20.00	.....	.....	.....	.....	.....	20.00
General Equipment	.....	805.95	.....	.....	223.74	5.75	.....	1,035.44
	$7,306.11	$103,642 78	$21,650.93	$25,134.75	$17,390.93	$3,211.24	$183.20	$178,519.94
Contract Retainer on elevator	.....	100.00	.....	.....	.....	.....	.....	100.00
Special Fund—Retaining Wall	.....	.....	.....	.....	386.26	.....	.....	386.26
Grand Total	$7,306.11	$103,742.78	$21,650.93	$25,134.75	$17,777.19	$3,211.24	$183.20	$179,006.20

STATEMENT SHOWING REFUSE DELIVERED AND DISPOSED OF AT THE CITY INCINERATOR PLANT IN 1919.

Month	GARBAGE			ASHES			RUBBISH			MANURE		TOTAL
	C.C. tons	P.C. tons	Total	C.C. tons	P.C. tons	Total	C.C. tons	P.C. tons	Total	P.C. tons	Total	Tons
January	2,272	30.12	2,302.12	.....	806.41	806.41	....	202.92	202.92	....	....	3,311.45
February	1,617	41.57	1,658.57	.....	713.29	713.29	....	198.02	198.02	....	....	2,569.88
March	1,924	22.53	1,946.53	.....	879.16	879.16	...	214.58	214.58	....	....	3,040.27
April	2,085	17.31	2,102.31	8.42	596.54	604.96	...	144.85	144.85	....	....	2,852.12
May	2,380	17.98	2,397.98	96.12	485.86	581.98	.57	121.80	122.37	....	....	3,102.33
June	2,899	49.92	2,948.92	16.68	493.69	510.37	...	167.76	167.76	.52	.52	3,627.57
July	3,409	68.68	3,477.68	20.18	458.74	478.92	...	162.74	162.74	2.14	2.14	4,121.48
August	3,679	30.89	3,709.89	20.99	476.93	497.92	...	142.27	142.27	....	.. .	4,350.08
September	3,604	29.37	3,633.37	15.77	584.78	600.55	...	148.32	148.32	.50	.50	4,382.74
October	3,417	41.24	3,458.24	14.72	539.07	553.79	...	119.64	119.64	....	...	4,131.67
November	2,528	52.47	2,580.47	80.01	598.31	678.32	...	95.10	95.10	....	....	3,353.89
December	2,236	65.35	2,301.35	53.87	936.05	989.92	...	67.55	67.55	....	....	3,358.82
Totals	32,050	467.43	32,517.43	326.76	7,568.83	7,895.55	.57	1,785.55	1,786.12	3.16	3.16	42,202.30

C. C.—City Collection

P. C.—Private Collection.

Report of
Bureau of Illumination Service
For the Year
1919

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

We are handing you herewith report of the Bureau of Illumination Service for the year ending December 31, 1919.

The construction work of the year as done by contractors includes the finishing of the installation contract of 1918 and the awarding of a contract that called for the installation of about 625,000 feet of underground cable and the erecting of about 1,000 posts. At the time we stopped construction in the fall on account of frost, we had installed 625,000 feet of cable and about 2,800 posts, leaving about 1,200 posts to be set in 1920 on this contract. The underground series multiple transformers have been installed for nearly all of the posts which have been erected up to the present time.

The materials bought for construction include about 125,000 feet of primary high voltage cable and about 150,000 feet of secondary low voltage cable. This cable was bought through the Central Board of Purchases and at a very satisfactory price. We will, however, have to buy about 700,000 feet of cable in the spring for our 1920 work at which time we will, from all indications, pay a higher price.

We will also award an installation contract in April which will include the remainder of the posts and cable to be installed as per the recommended system. This will equal in quantity the amount installed in 1919. Thereforfe, if we have the use of the bonds as asked for in the 1920 budget and a large enough contractor together with an early spring and a late fall we will complete the installation during the year.

Nearly all of our electric and photometric laboratory equipment has been received and enough has been put in use to partly determine the best and most efficient lamps for our use, as well as the electrical testing of various natures for the public as well as all of the city's departments. We have been perhaps a little backward in completing this important department of the bureau but it is due to the possibilities of our having to move from our present quarters at 510 Edison Avenue, which would involve a great cost if all of the equipment was permanently erected and installed, therefore, we recommend that if the city does not elect to build a central electric generating station in the very near future that there be put in the budget of 1920 sufficient funds to buy the present building and ground occupied or similar quarters in the close vicinity of the City Hall.

To date we have replaced 560 old T. M. E. R. & L. Co.'s arc lamps, 1,474 old gas lamps and 166 gasoline lamps with the city's new units. The rest of our units have been installed at locations where there were no lights of any kind whatever.

The amount of lamp outage for which we have made deduction from monthly bills is as follows.

Old arc lamps reported out	2,551
Old gas lamps reported out	7,803
Old gasoline lamps reported out	1,890

Our ability to care for lamps reported out and for patrolling ou circuits have been impaired somewhat due to inadequate and dilap dated motor vehicle equipment which has been in some cases directl responsible for the length of time the lamps are out. We hav authority to buy one new tower wagon which will relieve this to certain extent but we must also purchase more of these in 1920.

We trust that the department's request for motor car equip ment to the Municipal Garage will be accepted so that it will no be necessary for us to postpone our work or go outside for aut hire as we have had to do in several instances during the year.

The number of street lights in service at the present time an their kind is as follows:

Old arc lamps	1,758
Old gas lamps	1,683
Old gasoline lamps	105
New city units gas and electric	3,847
Total	7,393

The number of street lights in service January 1st, 1916 wa 5,746. We therefore have 1,647 more lamps in service at the pres ent time than we had in 1916 or an increase of 28 per cent.

There were ten electric traffic posts erected during the year These were of the dwarf wooden type which seems to regulat traffic better than the old high iron posts which were more expensiv and dangerous. We have developed a new safety button which woul have been in service before spring had it not been for the con tinued delay in getting the special glass and castings. To show th need of a signal that cannot be injured we submit the following:

Number of traffic posts in use	27
Number of traffic posts damaged	71
Number of people to whom bill for damage was sent	58

The following is the financial report of the Bureau, showing the cost of construction as well as maintenance and operation:

STATEMENT OF EXPENSES, RESERVES AND ABATEMENT OF EXPENSE

BUREAU OF ILLUMINATION SERVICE—Maintenance and Operation.

General Office—			
Expense		$ 11,186.72	$ 11,186.72
Laboratory—			
Expense		3,896.19	
1920 Reserve		460.02	
Total Charges		4,356.21	
Credits			
1919 Reserves	$1,095 22		
Abatement of Expense	15 31	1,110.53	3,245.68
Storehouse—			
Net Expense		3,016.52	3,016.52
Street Lighting—Operation—			
Expense		266,703.71	
1920 Reserve		539.89	
Total Charges		267,243.60	
Credits			
1919 Reserves	1,568.00		
Abatement of Expense	46.41	1,614.41	265,629.19
Street Lighting—Maintenance—			
Expense		37,859.90	
1920 Reserve		1,955.18	
Total Charges		39,815.08	
Credits			
1919 Reserve	1,968.20	1,968.20	37,846.88
Construction (Gas Unit)—			
Expense		7,973.63	
1920 Reserves		1,416.00	
Total Charges		9,389.63	
Credits			
1919 Reserve	4,389.63	4,389.63	5,000.00
Miscellaneous—Special Funds—			
Expense		3,222.28	
1920 Reserves		3,135.98	
Total Charges		6,358.26	

Credits			
1919 Reserve	4.00		
Abatement of Expense	478.32	482.32	5,875.
Total Expense—Maintenance and Operation			$331,800.

STATEMENT OF IMPROVEMENTS IN PROGRESS.

BUREAU OF ILLUMINATION SERVICE—Electric Light Plant.

Jan. 1, 1919 Balance	$470,882.96	
Proceeds from Sale of Bonds	300,000.00	
Miscellaneous Revenue	3,266.17	
Total Revenue		$774,149.
Dec. 31, 1919 Cost of Improvements	496,646.13	496,646.
Jan. 1, 1920—Cash Balance		$277,503.
The cash balance being divided as fololws:		
Reserves for Purchase Orders	25,419.13	
Reserves for Contracts	104,830.10	130,249.
Unencumbered Balance	147,253.77	147,253.
		$277,503.

WILLIAM W. RUMSEY,
Engineer in Charge of Construction and Maintenanc

HOWARD F. ILGNER,
Illuminating Engineer.

Report of

Water Works

For the Year Ending

Dec. 31, 1919

MILWAUKEE WATER WORKS

*Deputy Commissioner of Public Works
PERCY BRAMAN

Superintendent of Water Works and Water Purification
HENRY P. BOHMANN

City Engineer
GEO. F. STAAL

Thos. McMillan ----------Chief Engineer of power Plants
Ferdinand Krieger --------Assistant Chief Engineer of Power Plants
William Kunz ----------Engineer in Charge of North Point Pumping Station
William Bormann ---------Engineer in Charge of High Service Pumping Station
John Koch ----------Superintendent of Distribution.
Ferd. E. Fitz----------Assistant Superintendent of Distribution
Frank J. Murphy----------Superintendent of Meters
Oswald J. Ronge----------Chief of Collection Division
Arthur J. Conaty ----------Chief Accountant (General Office)
Walter Windfelder ---------Head Bookkeeper (General Office)
George J. Roderer----------Keeper of Pipe Yard
Robt. L. Piper----------Water Chemist

Committee on Water Works
ALD. JOHN W. RADKE, Chairman.
ALD. JOHN DOERFLER, JR. ALD. JOS. P. CARNEY
ALD. ROBERT J. LANDOWSKI ALD. HERMAN O. KENT

*On September 30, 1917, Mr. Fred G. Simmons resigned as Commissioner of Public Works. No successor being appointed, the Deputy Commissioner under the City Charter assumes the duties of the Commissioner of Public Works.

REPORT OF SUPERINTENDENT
OFFICE OF SUPERINTENDENT OF WATER WORKS AND WATER PURIFICATION
CITY HALL

Milwaukee, January 25, 1920

Mr. Percy Braman,

Deputy Commissioner of Public Works—

Dear Sir:

I respectfully submit herewith the annual report of the activities of the Water Works for the calendar year ended December 31, 1919.

The following is a condensed statement of the revenues and expenditures of the department for the year 1919:

FINANCES

Operating revenues (water only)		$1,132,072.27
Operating expenditures	$458,972.78	
Depreciation	112,658.10	
		571,630.88
		$ 560,441.39
Quasi operating revenues	$ 60,584.54	
Quasi operating expenditures	46,931.24	13,653.30
Financial revenue		131.33
Gross income from operation		$ 574,226.02
Deductions from above—interest on bonded debt		9,450.00
Net income from operation		$ 564,776.02
Other revenues received—Water Pipe Assessment		13,582.69
Total net income from all sources		$ 578,358.71

DISPOSITION OF NET INCOME

Transfer to General City Fund	$200,000.00	
Transfer to unreserved proprietary interest	378,358.71	
		$ 578,358.71

Total amount expended for new construction work and outlays during the year was $341,991.00.

Total proprietary interest—December 31, 1919	$10,269,570.72
Cost of Water Works, less depreciation	9,395,122.14
Bonded indebtedness, less sinking fund on hand	195,000.00

FINANCIAL

It is very gratifying to be able to report an increase in the revenues for water for the year 1919, notwithstanding the fact that there was a reduction in the total pumpage for the year amounting to 258,000,000 gallons.

The total revenues for water only were $1,132,072.27, being an increase of $30,794.88 over the previous year. This gives us a revenue of $50.11 per million gallons pumped which is the highest rate since our present meter rate is in force. A systematic campaign for the elimination of all avoidable water waste, started in 1912 and continued since, has increased the revenue per million gallons pumped from $45.80 in 1911 to $50.11 in 1919, although there has been no increase in water rates during the entire period. The total revenues of the Water Department from all sources during 1919 were $1,206,370.83.

The net income of the Department over and above operation, maintenance, depreciation and interest on bonded indebtedness was $578,358.71.

As in previous years the sum of $200,000.00 of the net income was transferred to the General City Fund toward reducing the general taxes, the balance used for new construction and equipment.

All new construction work was paid for out of the surplus earnings and depreciation reserve cash of the Water Department, which under the Public Utility Law, may be used for new constructions, extensions or additions to property, or invested. The Department finds it more profitable to use the Depreciation Reserve Cash for new construction work rather than to invest this money and then issue bonds to do new construction work. There were no bonds issued during 1919.

The surplus earnings of the Water Works transferred to the General City Fund since 1892 now aggregates the sum of $2,117,965, which sum exceeds the sums raised by tax levy in the early years of the Water Works, before the Department was self-sustaining, by $1,240,425.28. The book value of the Water Works, less depreciation written off, is $9,395,122.14, with a bonded indebtedness of only $195,000.00, after deducting the sinking fund on hand.

Since the sums transferred to the General City Fund exceed the sums raised by tax levy, the entire Water Works has been paid for out of the earnings of the Department

STATEMENT SHOWING ESTIMATED COST OF SUPPLYING WATER AND REVENUE RECEIVED FOR SUPPLYING WATER TO CONSUMERS DURING THE YEAR 1919

	Cost	
Cost of operation	$458,972.78	
Interest on bonded debt	9,450.00	
Total ordinary expenditures		$ 468,422.78

Sinking fund for bonded indebtedness	15,000.00	
Depreciation of Water Works' property and equipment	112,658.10	
*Taxes on true value of Water Works property	172,250.16	
*Interest on net invested capital at 4%	375,804.88	675,713.14
		$1,144,135.92

Revenue

Total revenue for water only	$1,132,072.27
Revenue per 1,000 gallons based on total pumpage	.05011

Cost of Supplying Water per 1000 Gallons

	Gallons
Total pumpage for year 1919	22,590,435,210
Cost per 1,000 gallons based on total pumpage and total ordinary expenditures	$.02073
Cost per 1,000 gallons based on total pumpage and total ordinary expenditures, plus sinking fund charges, depreciation, taxes and 4% interest on net invested capital	.05064

* The items of taxes and interest are not actually charged on the books of the Department. The Department has used these moneys for new construction work and outlays and in this manner has been able to pay for all new construction work and outlays from 1896 to 1913 without the necessity of issuing bonds. A bond issue of $300,000.00 was found necessary in 1913 for the construction of Section No. 1 of the Linwood Avenue Intake Tunnel, the contract for which amounted to $450,000.00. No bonds have been issued since 1913.

OPERATION AND MAINTENANCE

The cost of operation and maintenance for the year 1919, excluding depreciation was $458,972.78, which is an increase of $21,700.44 over the preceding year.

This increase would have been greater had it not been for the fact that our pumpage was 258,000,000 gallons less than the previous year. This increase is largely attributable to higher wages paid and also to the continued advancement in the cost of materials and supplies.

The increased cost of operation, however, is more than offset by an increase of $30,794.88 in the revenues received for water. The revenue of $50.11 per million gallons pumped for the year 1919 is an increase of $1.92 per million gallons over the preceding year.

WATER RATES

Since May 1, 1913, all services are metered, with the exception of such supplying Automatic Fire Sprinkling systems, fire hydrants, fire cisterns, horse drinking troughs and bubblers.

The metered rate, which remains unchanged, is 4½ cents per 100 cubic feet, or 6 cents per 1,000 gallons for water supplied within

the city; and 6 cents per 100 cubic feet, or 8 cents per 1,000 gallons for water supplied for consumption beyond the city limits. There is no "minimum charge" nor "service charge," the consumer paying only for actual consumption. The meter must be furnished and kept in repair by the consumer.

The charge for hydrant rental is $5.00 per hydrant per year; drinking troughs and bubblers each $50.00 per year.

Water is furnished outside of the city to the Villages of Shorewood, West Milwaukee, North Milwaukee, Whitefish Bay, the City of West Allis, County Institutions in the Town of Wauwatosa, and to a number of individual consumers in the Towns of Lake, Milwaukee, Greenfield and Wauwatosa.

WATER SUPPLY

Lake Michigan is the source of Milwaukee's entire water supply. The intake in service at present is known as the Linwood Avenue Intake and consists of a concrete lined tunnel 12 feet internal diameter and 6553 feet in length terminating with an octagon submerged intake crib 86 feet 7 inches long diameter, 80 feet short diameter and 12 feet in height in 67 feet depth of water.

The lake shaft which connects the intake crib with the tunnel is 12 feet in diameter and the bottom of the lake shaft 150 feet below city datum.

The submerged timber intake crib of the tunnel is located about five miles from the mouth of the harbor.

The capacity of the intake is approximately 220,000,000 gallons in 24 hours at a velocity of 3 feet per second and was designed to supply not only the present North Point Pumping Station, but also a future station which will be located on the Milwaukee River near Chambers Street extended, to be known as Riverside Pumping Station. A 9-foot short tunnel connects the intake with the North Point Pumping Station and has supplied same with water since December 23rd, 1918.

On December 12th, 1919, a contract was awarded to Herman Hohensee for the construction of a 9-foot concrete tunnel approximately 7,000 feet in length, the same to extend from the shore shaft of the Linwood Avenue Intake Tunnel located at Lake Park to the proposed Riverside Pumping Station on the Milwaukee River.

WATER PURIFICATION

The treatment of our water supply with liquid chlorine was continuous during the year and was performed under the careful supervision of the Chemist of the Water Department.

On only one day was there a slight objectionable taste observed in the water supply, otherwise the water has been free from all tastes during the entire year.

Daily bacterial analyses made of the untreated and treated water show the following results for the past year:

The number of bacteria found in 1 c.c. of untreated water incubated 48 hours at 20° C. on gelatin ranged from a minimum of 6 to a maximum of 7,640 with a mean of 410; on 20° agar incubated 48 hours from a minimum of 7 to a maximum of 48,300 with a mean of 1,084; and on 37° agar incubated 24 hours from a minimum of 0 to a maximum of 4,320 with a mean of 189.

In the treated water, the number of bacteria observed in 1 c.c. samples incubated 48 hours at 20° C. on gelatin ranged from a minimum of 0 to a maximum of 2,100 with a mean of 30; on 20° agar incubated 48 hours from a minimum of 0 to a maximum of 1,050 with a mean of 37, and on 37° agar incubated 24 hours from a minimum of 0 to a maximum of 390 with a mean of 24.

"Gas formers" (presumptive test) were present in the untreated water in 76.1% of all 10 c.c. samples, 46.9% of all 1 c.c. samples, 21.7% of all .1 c.c. samples and 8.6% of all .01 c. c. samples examined. In the treated water "gas formers" were present in 25.4% of all 10 c.c. samples, 6.5% of all 1 c.c. samples and .9% of all .1 c.c. samples examined.

The B. Coli index based on confirmed tests shows the following results in the raw water: Minimum 0, maximum 100, mean 10.58 per c.c., or 1,058 per 100 c.c.; in the treated or tap water, minimum 0, maximum 10, mean .314, or 31.4 per 100 c.c. The standard fixed by the Treasury Department, United States Public Health Service for drinking water supplied to the public by common carriers in interstate commerce, promulgated by the Secretary of the Treasury on October 21, 1914, is 2 per 100 c.c.

The average bacterial reduction effected by the use of liquid chlorine based on incubations on the different media were as follows: On 20° gelatin 89.93%; on 20° agar 94.30%; and on 37° agar 84.32%.

The amount of chlorine applied varied from 16 oz. to 36 oz. per million gallons of water, or from .12 to .27 parts of available chlorine per million parts of water.

The typhoid death rate per 100,000 of population for the year 1919 was 3.5, there being 16 deaths and 47 cases reported by the Health Department. The typhoid death rate for 1919 is the lowest in the history of the City of Milwaukee.

Beginning February 1st, actual operations of the experimental water purification plant were started under the direction of Mr. Jos. W. Ellms, consulting engineer of Cleveland, Ohio. The building

in which these experiments are conducted is located on the grounds of the North Point Pumping Station. The purpose of these experiments is primarily to establish the most economical and practical method of filtering our water supply. The reasons for conducting these experiments can be summed up as follows:

1. To study methods of mixing chemicals with the water to be treated in order to produce maximum coagulative effects in the minimum space of time.
2. To ascertain the shortest effective periods of sedimentation.
3. To determine the highest rates of filtration consistent with a proper degree of bacterial removal.
4. To determine the most effective rates of filtration for several different sizes of filter sand.
5. To study the effect of modifying the strainer system on the filtering and washing processes.
6. To study the efficiency of ozone in disinfecting raw and filtered water.
7. To make any necessary studies on disinfection with chlorine for comparative purposes.
8. To observe the general effect of seasonal changes in the character of the raw lake water and their relation to the purification processes studied.

It is intended to carry on these experiments for a period of one year. At the expiration of the experimental period which will be Feb. 1st, 1920, a full and complete report will be submitted to the Common Council for further action.

PUMPING DIVISION

The total amount of water pumped from the lake at North Point Pumping Station during the year 1919 was 22,590,435,210 gallons, computed from the actual plunger displacement of the pumps, with no allowance for slippage. This is an average daily consumption of 61,891,603 gallons, and is an average daily decrease of 707,345 gallons from the previous year.

The maximum pumpage for any one day was on September 8th, viz.: 85,697,210 gallons, and the minimum pumpage on April 20th, 40,912,220 gallons. The maximum rate of consumption or "peak" on the day of highest pumpage was 112,000,000 gallons in 24 hours.

The average daily consumption for the past five years has been as follows:

Year	Gallons
1915	47,444,314
1916	54,885,366
1917	59,518,377
1918	62,598,948
1919	61,891,603

The amount of water repumped at the High Service Pumping Station was 1,638,223,400 gallons. In addition thereto, four high service pumping engines, located at the North Point Pumping Station delivered 9,675,533,000 gallons of water direct into the high level district. The amount of water delivered in the high level district was 50.00 per cent. of the total pumpage.

The total amount of water furnished to consumers outside of the city was 3,080,729,985 gallons, or 13.63 per cent. of the total pumpage.

The revenue received for water furnished outside of the city was $249,508.35, or 22.04 per cent. of the total revenue received for water.

The average head pumped against in the low service district was 162.5 feet; high service district 285.8 feet. Average head of high and low service 215.08 feet, which is an increase of 3.6 feet over the preceding year.

The average duty of all engines at North Point Pumping Station was 109,080,513 foot pounds per 100 pounds of coal, and for the High Service Station 82,623,680 foot pounds, being an increase of 2,786,528 and 3,084,077 foot pounds, respectively, compared with the year 1918. During the past year it was possible to again contract for coal on the "B. T. U." basis, temporarily suspended during the war. A better and more uniform grade of coal was delivered which is reflected in the higher station duty.

On July 24th, 1919, a contract was awarded to the Allis-Chalmers Mfg. Co. for furnishing and erecting in place at the North Point Pumping Station of the Water Works, one Triple Expansion Pumping Engine capable of delivering 20,000,000 gallons of water every 24 hours into the low service district against a total head of 160 feet, with a steam pressure of 125 pounds per square inch at the throttle, a piston speed of 200 feet per minute, with a stroke of 60 inches. The contract calls for the completion and erection of the pumping engine within one year from the date of the contract. The contract price is $225,000.00.

This pump will replace the old Vertical Compound Pumping Engine installed in 1882 and known as No. 3 Pump. Owing to its obsolete type it had no value other than that of scrap and was sold to Seeboth Bros. Co., scrap dealers, for the sum of $2,344.48, the purchaser being obliged to remove the pump from the station.

When this new pumping engine is erected there will be eight triple expansion pumping engines housed in the North Point Pumping Station having a total pumping capacity of 126,000,000 gallons in 24 hours, with 5,000 total nominal horse power. In order that a proper ratio of horse power be maintained between pumping engines and boilers, the Chief Engineer of Power Plants recommends the removal of three of the horizontal tubular boilers of 150 H. P. each, located in the north boiler house and install in place

thereof two 400 H. P. water tube boilers. This will bring the boiler H. P. up to 2,500 which will be ample. This change will be made during the coming year as funds have been provided for in the 1920 budget for the purpose.

At the High Service Pumping Station nothing but ordinary repairs were found necessary, most of which were done by men employed in the department. This station operates during the day hours only and is a "booster" for the high level district.

WATER CONSUMPTION--1919

1	Municipal Use (Gallons) 2	Industrial Use Power and Mfg. (Gallons) 3	Commercial Use Dwellings and Stores (Gallons) 4	Total Gallons 5	Per Cent. 6
Total Metered Consumption	1,139,900,400	8,311,715,380	7,375,969,400	16,827,585,180	78.41
Estimated flat rate consumption	1,109,380,549	45,792,666	6,070,000	1,161,243,215	5.41
Unmetered free use (See details in report of Supt. of Meters)	----------	----------	----------	142,907,000	.67
Under-registration of meters (Estimated at 3% of water passed through meters)	----------	----------	----------	520,440,780	2.43
"Unaccounted for"	----------	----------	----------	2,808,737,275	13.08
Totals	2,249,280,949	8,357,508,046	7,382,039,400	21,460,913,450	100.00

(Total pumpage based on plunger displacement of pumps—22,590,435,210 gallons, less 5% estimated slippage of pumps—21,460,913,450 gallons delivered into distribution mains.)

Estimated population supplied, including suburbs—500,000.

	Gallons per Capita	Percentage of Net Pumpage
Municipal Use	12.33	10.48
Industrial Use	45.79	38.95
Commercial Use	40.45	34.39
Under-registration of Meters	2.85	2.43
Departmental free use	.78	.67
"Unaccounted for"	15.39	13.08
	117.59	100.00

Gallons per capita for net pumpage ---------- 21,460,913,450 = 117.6

Gallons per capita for slippage of pump ---- 1,129,521,760 = 6.2

Gross Pumpage (Plunger Displacement) ---- 22,590,435,210 = 123.8

DISTRIBUTION DIVISION

During the past year only three miles of new water mains were laid inside of the City and not quite one mile of water mains abandoned, leaving at the close of the year 1919, 544.973 miles of water mains in service inside of the City, ranging from 4 inches to 42 inches in diameter.

A total of 1,536 tap and branch connections were made during the past year, of which number 906 were improvement taps and extended to curb only. This gives us a total of 85,628 tap and 2,321 branch connections made to date. Of this number 66,422 are active taps and 21,527 extended to curb only, or turned off at either curb or at the main and not in use.

Seventeen hydrants were added to the distribution system, giving us 3,771 at the close of the year. There were also 60 new gate valves set, the total now aggregating 4,459.

The 8-inch main in South Canal Street where it crosses Holton Canal, was originally laid in the bed of the Canal. Owing to the soft bottom of the Canal, this crossing had given considerable trouble from time to time and the cost of making repairs was always extremely high. When a serious leak again showed up last summer, this crossing was replaced with a new line laid on pile bents, spaced 6-foot centers, at a depth of 6 feet below the surface of the water and the old line abandoned. The work was done by the Great Lakes Dredge and Dock Company for the sum of $2,500.00. The connections at each end were made by the Water Department which also furnished the water pipe and specials. The total cost of this new crossing was $3,234.00. This cost includes one-half of the cost of replacing the old plank deck roadway with a new one as the old planking could not be used after taken up.

The 8-inch main in South Canal Street from Holton Canal to a point about 300 feet west of 20th Street was replaced by a new line of 12-inch pipe laid about 14 feet north of the location of the old 8-inch line. The latter line was immediately under and parallel with the north rail of the railroad tracks in South Canal Street Originally laid on a marshy bottom, this line had settled several feet, so that the pipe line was completely out of alignment with many leaky joints caused by the settling of the street and the jar and vibration of heavy railroad traffic immediately overhead. On account of its location, these repairs were extremely expensive, as it necessitated the timbering of the tracks in every instance. For these reasons and for the further reason that the street was about to be paved with a permanent pavement, the new line was laid and the old line abandoned, as the cost of taking up the old pipe, owing to its location under the railroad tracks, would have exceeded the value of the water pipe recovered. Great obstructions were encountered in laying the new line. About three feet below the surface an old abandoned railroad track several hundred feet in length was found,

it having been left in place when the street was filled from time to time. The oak ties were still in sound condition and the rails spiked to the ties. The rails had to be removed and the ties chopped through by hand before the contractor could proceed to lay the pipe. Piles, timbers and waste material from a former stone yard were encountered in the line of trench besides a great deal of water, making it one of the most disagreeable jobs of pipe laying ever undertaken in this city. On account of the lack of sufficient 12-inch pipe, the entire job could not be completed and there still remains about 275 feet to be laid immediately west of Muskego Avenue. All live services between Holton Canal and Muskego Avenue were reconnected with the new 12-inch main by the Water Department. The services between Muskego Avenue and 20th Street will be reconnected immediately after the uncompleted portion of pipe is laid early next year.

Another river crossing which has given the Water Department a great deal of anxiety in the past and which separated on several occasions, is the 16-inch main laid in the bed of the North Menomonee Canal at Muskego Avenue. Soundings taken last summer, preliminary to dredging the channel, showed that the crossing was in a dangerous condition and liable to let go at any moment. The churning of the propellers of the large coal boats going up the canal periodically wash away the bed of the river from under the water pipe for quite a distance, thereby leaving the pipe unsupported. An inspection made by a diver also disclosed the fact that there were two lead joints partly out, causing a great deal of leakage. Repairs were made by the Great Lakes Dredge and Dock Co., the cost of which was $1,284.81. As the Sewerage Commission contemplated the construction of a tunnel across the canal at this point for the purpose of carrying sewage across the canal by means of an inverted siphon, arrangements were made with the Sewerage Commission for the construction of a joint tunnel designed to carry both sewer and water pipes. This tunnel will be of concrete construction, 7½ feet in diameter. The water pipe will be 24 inches in diameter and the sewage pipe 18 inches in diameter. The Water Department's share of the construction of this tunnel will be about $53,000.00, exclusive of the water pipe. As this crossing has given out on several occasions and is located in a very hazardous district, it will be a great relief to have this crossing where it will be free from further disturbances.

On August 11th at 6:15 P. M., a serious leak was reported in the 30-inch feeder main in St. Paul Avenue at the west bank of the Menomonee River in the town of Wauwatosa. The line was shut off and upon digging down it was found that the pipe had buckled up, necessitating the cutting out of four lead joints in order to get the pipe back in its original position. The joints were then re-run, the pipe fitted with lugs and bands and tied together with 1¼-inch rods. This in all probability will prevent

future trouble of this kind. The line was turned on again on August 16th. This line being the principal feeder supplying the City of West Allis, satisfactory service could not be maintained, as the only other feeder was a 12-inch main which was entirely inadequate to supply the demand. A similar accident occurred on the east side of the river in 1918. Now that the pipes and curves on both sides of the river crossing are strengthened with rods and straps, there is little likelihood of further trouble at this crossing. This emphasizes the fact that curves used to lower feeder mains to the bed of a river should be lugged and fitted with bands and tie rods. There is no question that the lack of such reinforcement was the cause of the pipe pulling apart.

A contract was awarded to Herman Hohensee on May 7th for the construction of a concrete water pipe tunnel across the Menomonee River from West Water Street to Reed Street, this tunnel to carry the 24-inch feeder main which formerly crossed the river at the foot of Third Street extended. Upon the completion of the widening of the Menomonee River by the United States Government in 1917, it was discovered that the river crossing had been damaged in some manner by either a boat or dredge, so as to make this crossing unfit for further use. It was thereupon decided to abandon this crossing and substitute in place thereof at Reed Street, a water pipe tunnel as a better and safer method of carrying a feeder main across a navigable stream. The contractor is making good progress in the prosecution of his contract and will complete the job early in 1920.

A total of 19 breaks in water mains occurred during the past year, of which 4 were due to electrolysis.

A detailed report of the work performed by this Division, is given in the report of Superintendent of Distribution.

KILBOURN PARK RESERVOIR

The Reservoir, which is located in Kilbourn Park, is not a storage reservoir but rather an "equalizing reservoir" which equalizes the water pressure in the low service district and also serves as a source of supply for the High Service Pumping Station, located on North Avenue, between 10th and 11th Streets. The average width of the Reservoir is 310 feet; average length 515 feet. The depth of the water in the Reservoir when filled is 215 feet and the elevation of the water at this height is 150 feet above city datum. The capacity of the Reservoir is 21,000,000 gallons.

The park connected with the Reservoir was kept in its usual attractive condition. As in previous years, band concerts were given during the months of July and August. There were seven concerts and the cost of same, amounting to $567.00, was paid for out of the water fund.

A concrete protection wall 360 feet in length was built along th driveway at the east line of the park, this being an extension of similar wall built along Reservoir Avenue up to the park line durin the previous year. The work was done by Edward R. Kisslich unde contract dated July 8, 1919, at a cost of $1,950.00.

The roadway along the east line of the park from Reservoir Ave nue to Garfield Axenue was re-constructed with a tar macadar surface and a combination curb and gutter built on the west sid of the roadway at an aggregate cost of $3,366.92. This work wa done by the Street Construction Department of the Department o Public Works.

At the intersection of Garfield Avenue and the extension of Nortl Avenue running north and south through the park, the radiu curbing was set back a distance of 15 feet on the northeast corne and a portion of the hill cut down and terraced so as to afford wider street intersection and also a more unobstructed view fo automobilists, since a number of accidents, which might have turne out seriously, have happened at this intersection. In cutting dow the hill a double terrace was provided. On the lower one a concrete foundation was built for the reception of a monument to be erecte by the citizens of the Sixth and Thirteenth Wards in memory of th soldiers who enlisted in the late war from the above mentioned wards.

The following table indicates the depth of water maintained i the Reservoir each month for the past year.

Month	Highest Feet	Lowest Feet	Mea Fee
January	21.80	17.80	20.22
February	21.80	17.00	20.11
March	21.70	15.20	19.39
April	21.70	16.90	20.02
May	21.50	16.00	19.99
June	21.70	17.20	20.14
July	21.90	17.80	20.77
August	21.90	18.30	20.90
September	21.70	17.20	20.80
October	21.90	17.90	20.69
November	21.90	16.20	20.34
December	21.70	16.10	19.97
Highest during year	21.90		
Lowest during year		15.20	
Average Mean			20.28

METER DIVISION

There were 1,427 new meter installations made during the past year and 730 meters taken off on account of removal of buildings or replacement with new meters, etc., leaving a net gain of 697 meters for the year and a grand total of 65,769 meters in service on December 31, 1919.

A total of 18,214 meters were repaired, of which number 9,341 were repaired in the shop and 8,873 were repaired on the premises.

A site for a new meter repair shop was acquired during the past year. It is located on the west side of Market Street between Johnson and Martin Streets and has a frontage of 60 feet by 120 feet in depth. The purchase price was $13,200.00. Plans for the shop have been prepared by the Bureau of Bridges and Public Buildings and the necessary funds for the construction of the shop have been provided for in the 1920 budget. It is sincerely hoped that the building will be ready for occupancy before the close of the year 1920, so that our meter repairmen may be housed in a more sanitary shop than the one at present occupied in the basement of the City Hall.

For full details of the operation of this Division, see report of the Superintendent of Meters.

COLLECTION DIVISION

This division is responsible for the reading of meters and the assessment and collection of some 65,000 customers' accounts. In order to facilitate the office work of this Division, labor saving equipment has been installed from time to time. During the past year there was installed a bookkeeping or ledger posting machine for handling what is known as "straight accounts", that is to say, an account where the meter has been in continuous service during the entire assessment period of three months. This machine fills in present and previous readings, makes subtractions and prints the extension or amount on the ledger cards. The machine has proven its worth from every standpoint. It assures greater accuracy, much more work can be accomplished and errors are reduced to a minimum. As fast as the old style ledger cards are filled, more of this work can be done by machine and additional machines should then be purchased. The installation of addressographs, billing machines and ledger posting machines give this division labor saving equipment equal to any up-to-date office and has been highly commented on by outside parties looking into our method of handling customers' accounts. These various labor-saving devices not only assure greater efficiency but also tend to keep down the cost of clerk hire.

CONCLUSION

In conclusion I desire to return my sincere thanks to the Deputy Commissioner of Public Works and other City Officials for their generous support in all matters pertaining to the Water Works.

I also wish to express my appreciation to the employees of the Water Works for their loyalty and efficient co-operation during the past year.

The usual statistical matter relating to the Water Works is presented in the following pages.

Yours truly,

H. P. BOHMANN,
Supt. Water Works and Water Purification.

SUMMARY OF STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1919

In form recommended by the New England Water Works Association.

MILWAUKEE WATER WORKS

Milwaukee, Milwaukee County, Wisconsin

GENERAL STATISTICS

Population by census of 1910—373,857. Present population estimated at 475,000.

Date of original construction—1872-1874.

By whom owned—City of Milwaukee.

Mode of supply (whether gravity or pumping)—pumping.

PUMPING STATISTICS

1. Builders of pumping machinery—Edward P. Allis Co., Allis-Chalmers Mfg. Co., Wisconsin Engine Co.
2. Description of fuel used:
   (a) Kind—Bituminous
   (b) Brand of coal—Youghiogheny screenings and West Virginia Splint screenings.
   (c) Price of coal per ton of 2,000 lbs., delivered by team to Pumping Station:

North Point Station:	
Youghiogheny screenings	$4.75 to $5.25
West Virginia Splint	4.75 to 6.43
High Service Station:	
Youghiogheny Screenings	4.95 to $6.58
West Virginia Splint Screenings	4.95 to 6.58

   (d) Percentage of ash of coal consumed at North Point Pumping Station—18.6.
   (e) Percentage of ash of coal consumed at High Service Pumping Station—12.358.
   (f) Wood, price per cord—none used.
3. Coal consumed:
   (a) North Point Pumping Station (for all purposes)—37,220,690 lbs
   (b) North Point Pumping Station (while pumping)—37,148,690 lbs
   (c) High Service Pumping Station (for all purposes)—2,345,200 lbs
   (d) High Service Pumping Station (while pumping)—1,991,400 lbs
4. Pounds of wood consumed ÷3= equivalent amount of coal—none.
   (a) Amount of other fuel used—none.
5. Total equivalent coal consumed for the year (4) lbs.—none.

6. Total pumpage for the year:
   (a) North Point Pumping Station (where all direct pumpage from the lake is done)—22,590,435,210 gallons.
   (b) High Service Pumping Station (where the water is repumped from the reservoir into the High Service district)—1,638,223,400 gallons.
7. Average static head against which pumps work (North Point Pumping Station low service)—150 feet.
8. Average dynamic head against which pumps work:
   (a) North Point Pumping Station, low service, 162.530; high service 285.845. Average of high and low service—215.08 feet.
   (b) High Service Pumping Station, 120.427 feet + suction head, 9.355 feet+128.30 feet elevation of gauge = 258.082 feet above datum.
9. Number of gallons pumped per pound of equivalent coal (5)—none.
10. Duty— $\left\{ \begin{array}{c} \text{Gals. pumped (6.A)x8.34 (lbs.)x100x} \\ \text{dynamic head (8.A)} \\ \hline \text{Total fuel consumed while pumping at North} \\ \text{Point Pumping Station (3B)} \end{array} \right\}$ =109,080,513 lbs
11. Cost of pumping figured on pumping station expenses, viz: North Point Pumping Station $197,710.54; High Service Pumping Station $22,640.37.
   (a) Per million gallons pumped at North Point Pumping Station, $8.75.
   (b) Per million gallons re-pumped at High Service Pumping Station, $13.82+8.75=$22.57.
12. Per million gallons raised one foot (dynamic)
   (a) North Point Pumping Station—$0.0468.
   (b) High Service Pumping Station—$0.1064.

STATISTICS OF CONSUMPTION OF WATER

1.	Estimated total population at date (city only)	475,000
2.	Estimated population on lines of pipe (city only)	475,000
3.	Estimated population supplied (includes suburbs)	500,000
*4.	Total consumption for the year	22,590,435,210 Gallons
5.	Passed through meters	16,827,585,180 Gallons
6.	Percentage of consumption metered	74.49
7.	Average daily consumption	61,891,603 Gallons
8.	Gallons per day to each inhabitant (1), after deducting water furnished outside of city	112.5 Gallons
*9.	Gallons per day to each inhabitant, including population supplied outside of city (3)	123.8 Gallons
*10.	Gallons per day to each tap	931 Gallons

(This is figured on taps in actual use, of which number 65,769 are metered, 187 elevator indicators and 466 unmetered.)

The latter consists of 233 Automatic Fire Sprinkler Systems, Public Drinking Troughs, Bubblers, etc.).

11. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation ($571,630.88)—$25.30.

12. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation, plus interest on bonds, —$25.72.

---

* No deduction for slippage, estimated at 5%.

STATISTICS RELATING TO DISTRIBUTION SYSTEM MAINS

1. Kind of pipe—Cast iron.
2. Sizes—From 4 to 42 inch.
3. Extended—15,924 lineal feet, 3.016 miles.
4. Discontinued lineal feet—5,087—.963 miles.
5. Total now in use—544.973 miles.
6. Cost of repairs per mile, including valves and boxes—$16.20.
7. Number of leaks per mile—.15.
8. Length of pipe less than 4 inches in diameter—none.
9. Number of hydrants added during the year—19; 2 cut out.
10. Number of hydrants now in use—3,771.
11. Number of stop gates added during the year—60.
12. Number of stop gates now in use—4,459.
13. Number of stop gates smaller than 4-inch—1.
(In addition to the above gates, there are 2,321 gates from 2 inches to 8 inches, controlling branch connections.)
14. Number of blow-offs—64.
15. Range of pressure on mains—20 to 90 pounds.
16, 17, 18, 19, 20, 23, 24—All services put in by consumer.
21. Number of services (taps and branches) added during the year—1,536.
22. Number of services connected to mains—85,628 taps and 2,321 branches, a total of 87,949.
25. Number of new meters added during the year—1,427.
26. Number of meters now in use—65,769, after deducting 730 meters permanently off.
*27. Percentage of services metered—99.
28. Percentage of receipts from metered water—94.94.
29. Number of motors and elevators added—none; 5 taken out.
30. Number now in use—187.

---

* Figured on services in actual use, of which 65,769 are metered, 187 elevator indicators and 466 unmetered. The latter consists of 233 Automatic Fire Sprinkler Systems, Public Drinking Troughs, Bubblers, etc.

NOTE.—A more complete report of the Water Works is published under separate cover, giving the detailed activities of each division of the Water Works, which report may be had on request.

STATEMENT OF COST OF CONTRACT HOUSE DRAIN AND WATER CONNECTION INSPECTIONS AND SPECIAL HOUSE DRAIN INSPECTIONS.
1919.

Months:	Salaries Paid	Reimbursements (less profits) on special inspections:	Profits on Special Inspections:	Net cost:
January	--------	--------	--------	--------
February	--------	--------	--------	--------
March	--------	--------	--------	--------
April	$216.00	--------	--------	$216.00
May	297.00	--------	--------	297.00
June	300.00	--------	--------	300.00
July	300.00	$36.00	$2.40	261.60
August	312.00	102.00	6.80	203.20
September	213.00	78.00	5.20	129.80
October	162.00	162.00	10.80	--------
November	150.00	150.00	10.00	--------
December	102.00	102.00	6.80	--------
Totals	$2,052.00	$630.00	$42.00	$1,407.60
Net cost of inspection				$1,380.00

RECAPITULATION:

**Gross cost of inspections		$2,052.00
Reimbursements (less profits) on special inspections	$630.00	
Profits from special inspections	42.00	
Reimbursements and profits		$672.00
Net cost of inspections		$1,380.00

**City is reimbursed for all special inspections by the house drain layers for whom such inspections are made. On special inspection service a charge of 5 cents per hour, in excess of cost, is made.

THE LIBRARY OF THE
NOV 1 9 1942
UNIVERSITY OF ILLINOIS

REPORT

STE

Bremen S
Clybourn
Green Ba
Hi Moun
N. S. of N
*North A
Teutonia
Teutonia
6th St. -
6th St. -
8th St. -
17th St.
18th St.
20th St.
W. 24th
29th St.
55th St.
56, 57, 58

*Con

Mason

REPORT ON CONTRACT DRAINS AND WATER CONNECTIONS AND COST OF INSPECTION THEREOF IN THE FOLLOWING DESCRIBED STREETS DURING THE YEAR 1919.

WEST SIDE

STREET	FROM	TO	CONTRACTOR	INSPECTOR	COST
Bremen St.	Burleigh St.	Hadley St.	A. Kehrein	H. J. Prieser	$ 78.00
Clybourn St.	25th St.	27th St.	G. Zimmermann	J. Savage	39.00
Green Bay Av.	Graham St.	City Limits	G. Zimmermann	J. Savage	258.00
Hi Mount. Boul.	Elm St.	North Av.	G. Zimmermann	J. Savage	48.00
N. S. of North Ave.	58th St.	60th St.	G. Zimmermann	J. Savage	48.00
*North Av.	53rd St.	60th St.	W. T. Werner	J. Savage	12.00
Teutonia Av.	Franklin St.	City Limits	A. Kehrein	J. Savage	210.00
Teutonia Av.	Nash St.	Franklin St.	A. Kehrein	Savage and Prieser	135.00
6th St.	Burleigh St.	Concordia Av.	F. A. Goll	J. Savage	12.00
6th St.	Concordia Av.	Davis St.	F. A. Goll	H. Prieser	3.00
8th St.	Center St.	Burleigh St.	G. Zimmermann	H. Prieser	12.00
17th St.	Center St.	Chambers St.	G. Zimmermann	H. Prieser	18.00
18th St.	Teutonia Av.	Davis St.	F. A. Goll	H. Prieser	12.00
20th St.	Keefe Av.	Teutonia Av.	A. Kehrein	H. Prieser	126.00
W. 24th St.	Pease St.	Franklin St.	F. A. Goll	J. Savage	24.00
29th St.	Concordia Av.	Townsend St.	A. Kehrein	Savage and Prieser	18.00
55th St.	Pabst Av.	Elm St.	W. T. Werner	H. Prieser	96.00
56, 57, 58, 59th Sts.	Pabst Av.	City Limits	F. A. Goll	J. Savage	27.00
				Total	$1,176.00

*Contract started in 1918. (Inspection cost of work done in 1918 was $27.50.)

EAST SIDE

Mason St.	Jackson St.	Juneau Pl.	F. A. Goll	H. J. Prieser	3.00
				Total	3.00

SOUTH SIDE

Beulah Av.	Russell Av.	Estes St.	G. Zimmermann	J. Savage	54.00
Pryor Av.	Kinnickinnic Av.	Ellen St.	G. Zimmermann	J. Savage	57.00
South Bay St.	Kinnickinnic Av.	Lincoln Av.	A. Kehrein	H. Prieser	102.00
1st Av.	150 ft. S. of Maple St. to Grant St.		F. A. Goll	J. Savage	12.00
8th Ave.	Forest Home Av.	Grant St.	F. A. Goll	J. Savage	18.00
				Total	243.00

PRIVATE CONTRACTS

Oklahoma Av. and N. Wes. Ry. Co. Right of Way	Chas. Petunek	J. Savage	252.00
South Pierce St. betw. 22nd and 23rd Av.	S. Thompson	J. Savage	162.00
14th and 15th Sts., Atkinson Av. to Lake St.	A. Kehrein	H. Prieser	60.00
27th St. and Keefe Av. (A. O. Smith Co.)	R. Wenzel	J. Savage	30.00
37th and 38th Sts., Locust St. to Burleigh St.	F. A. Goll	J. Savage	126.00
		Total	630.00
		Total	$2,052.00

UNFINISHED CONTRACTS

22nd St.	Keefe Av.	Melvina St.	Contract let—work not started.
Pease St.	W. 24th St.	27th St.	Contract let—work not started.
21st St.	Keefe Av.	Pease St.	Contract let—work not started.
Oakland Av.	Folsom St.	Edgewood Av.	Contract let—work not started.

Mun. Ref.

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN



UNIVERSITY OF WISCONSIN LIBRARY
APR 23 1921

For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN TWENTY

99

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN

UNIVERSITY OF ILLINOIS LIBRARY
APR 23 192

COMPLIMENTS OF
PERCY BRAMAN
DEPUTY COMMISSIONER OF PUBLIC WORKS
MILWAUKEE, WISCONSIN
1920 REPORT

PLEASE EXCHANGE

DECEMBER THIRTY-FIRST
NINETEEN TWENTY

99

ANNUAL REPORT

OF THE

Department of Public Works

OF

MILWAUKEE, WISCONSIN

UNIVERSITY OF ILLINOIS LIBRARY
APR 23 192



For the Year Ending

DECEMBER THIRTY-FIRST

NINETEEN TWENTY



352.5
M164
920

Mun. Ref.

Department of Public Works

PERCY BRAMAN
Deputy Commissioner of Public Works

HARLES J. VAN ETTA.....*Supt. Bureau Street Construction and Repairs.*
HARLES O. DAVIS.....*Supt. Bureau of Street Sanitation.*
AVID McKEITH.. ..... *Supt. Bureau of Bridges and Public Buildings.*
EORGE F. STAAL.....*City Engineer, Bureau of Engineering.*
ENRY P. BOHMANN .....*Superintendent Water Works and Water Purification*
ANK H. MAYHEW .....*Head Clerk.*

Office of

THE DEPARTMENT OF PUBLIC WORKS

Milwaukee, January 2, 1921.

the Honorable Mayor and Common Council of the City of Milwaukee.

ıtlemen.

Submit herewith the report of this department for the year 1920 ler captions embracing the various bureaus of the department, se reports being over the signature of the bureau heads.

Courteously yours,

PERCY BRAMAN,

Deputy Commissioner of Public Works.

Milwaukee, Wis., January 2, 192

Mr. Percy Braman,

Deputy Commissioner of Public Works.

Dear Sir:

I herewith submit the annual report of the Department of P lic Works for the year ending December 31st, 1920.

The report embraces the work of the Audit and Account and Assessment Division, also giving in detail the following informati

Statement of net expenditures of the department and its vari bureaus.

List of contracts awarded.

Number of permits issued, and revenue received.

List of streets placed under guarantee during 1920.

List of streets improved with yardage and cost of each.

Inventory of the department by bureaus.

The report of 1920 is compiled on the basis of the report of preceding year with little or no material change.

Respectfully submitted,

FRANK H. MAYHEW,

Head Clerl

Accounting Division

Statement of Net Expenditures for the year Ending

December 31st, 1920, of the

DEPARTMENT OF PUBLIC WORKS

Divided According to its Bureaus.

1920

GENERAL ADMINISTRATION

Administration—		
Salaries—Commissioner, etc.	$ 9,214.96	
Supplies—Office	67.20	
Contract or Open Order Service—Repairs, etc	361.55	
Fixed Charges—Advertising, etc	3,939.83	
Equipment—Office	214.25	
Special Fund—Traveling, etc	196.66	
	$13,994.45	
Audit and Accounts—		
Salaries—Chief Clerk, etc	$ 10,200.00	
Supplies—Office	732.54	
Contract or Open Order Service—Repairs, etc	67.70	
	$11,000.24	
Special Assessments—		
Salaries—Chief Assessment Clerk, etc	$ 8,905.00	
Supplies—Office	119.71	
Contract or Open Order Service—Repairs	6.00	
Advertising and Appraisals	6,991.70	4,292.55
	$16,022.41	$4,292.55

BUREAU OF STREET SANITATION

Superintendence—		
Salaries—Superintendent, etc.	$ 14,810.16	
Supplies—Office, etc.	577.10	
Contract or Open Order Service—Motor Vehicle Repairs, etc.	1,751.26	
Equipment—Office, etc.	93.30	
	$17,232.82	
Field—		
Salaries—Supervisors, etc.	$ 58,666.88	
Contract or Open Order Service—Auto, etc	1,947.00	
	$60,613.88	
Street Cleaning—		
Salaries—Labor, etc.	$257,912.90	
Supplies—General	6,500.98	
Minor Equipment—Tools, etc	17,920.66	
Contract or Open Order Service—Team Hire, etc	73,853.76	
Equipment—Self-propelled Apparatus	22,366.24	920.75
	$378.554.54	920.75

Sprinkling—

Supplies—Horse drawn apparatus, etc	$ 51.33	
Minor Equipment—Tools, etc	6.69	
Material—General	73.73	
Contract or Open Order Service—Team Hire, etc	44,391.92	
Fixed Charges—Rent, etc	9,570.00	
Equipment—General	973.31	1,289.00
	$55,066.98	$1,289.00

Flushing—

Salaries—Labor, etc.	$ 11,777.28	
Supplies—Horse drawn apparatus, etc	9,277.58	
Minor Equipment, Tools, etc	39.56	
Material—General	534 87	
Contract or Open Order Service—Team Hire, etc	40,062.25	
Fixed Charges—Rent, etc	957.00	
Equipment—General	13,515.53	
	$76,164.07	

Collection of Ashes and Rubbish—

Salaries—Labor, etc.	$248,008.90	
Supplies—Motor Vehicles, etc	2,714.11	
Minor Equipment—Tools, etc	1,332.39	
Contract or Open Order Service—Team Hire, etc	219,795.08	
Special Fund—Fall Rubbish Collection	5,998.10	
Special Fund—Spring Clean Up	6,981.50	
	$484,994.15	

Garbage Collection—

Salaries—Superintendent, etc.	$ 4,544.28	
Supplies—General, etc.	730 67	
Minor Equipment—Tools, etc	3.26	
Material—General	14.31	
Contract or Open Order Service—Team Hire, etc	216,001.31	
	$221,293.83	

Removal of Dead Animals—

Contract or Open Order Service—Team Hire, etc	$ 2,364.00	
Miscellaneous Accounts Receivable		60.00
	$2,364.00	$60.00

Cleaning Catch Basins—

Salaries—Labor, etc.	$17,183.83	
Supplies—General, etc	2,779.83	
Minor Equipment—Tools, etc	48.30	
Contract or Open Order Service—Team Hire, etc	3,820.01	
Equipment	11,189.47	
	$35,021.44	

Ward Yards—

Salaries—Superintendent, etc.	$ 14,568.55	
Supplies—General, etc.	788.86	
Minor Equipment—Tools, etc.	145.92	
Material—General	705.32	
Contract or Open Order Service—Team Hire, etc.	1,403.54	
Fixed Charges—Rent, etc.	180.00	
Equipment	48.70	
Special Fund—New Ward Yard Bldgs.	1,971.59	
Special Fund—Sewer and Water Connections	264.40	
Special Fund—Electric Lighting	13.96	
Miscellaneous Accounts Receivable		138.83
	$20,090.84	$138.83

Minor Street Repairs—

Salaries—Labor, etc.	$ 22,883.90	
Supplies—General	734.41	
Minor Equipment—Tools, etc	195.41	
Material—General	9,994.86	
Contract or Open Order Service—Team Hire, etc.	6,697.49	
Equipment—General	4.94	
Miscellaneous Accounts Receivable		125.83
	$40,511.01	$125.83

Public Drinking Fountains—

Salaries—Labor, etc.	$312.60	
Material—General	6.19	
Contract or Open Order Service—Repairs, etc	8,441.80	
Special Fund	981.93	
	$9,742.52	

Skating Rinks—

Salaries—Labor, etc.	$ 1,278.21	
Supplies—General	22.00	
Contract or Open Order Service—Team Hire, etc.	407.61	
	$1,707.82	

Street Signs—

Salaries—Labor, etc.	$ 1,337.60	
Supplies—General	2.78	
Material—General	149.25	
Special Fund	3,294.94	
	$4,784.57	

Miscellaneous—

Special Funds—

Street End Barricade	$ 518.61	
Cinder	4,796.47	
Kinnickinnic River	602.20	
Traffic Lines	233.52	
	$6,200.80	

Special Fund—		
Rotary Fund	$ 47.261.55	
Miscellaneous Accounts Receivable		51,629.83
	$47,261.55	$51,629.83
Oiling—		
Salaries—Superintendent, etc.	$ 4,140.15	
Supplies—Horse Drawn Apparatus, etc	343.64	
Minor Equipment	18.38	
Material—General	13,184.36	
Special Fund	69.25	
Contract or Open Order Service—Team Hire, etc	1,595.90	
Fixed Charges—Rent, etc.	10.00	
Equipment	1,782.90	
Special Fund—Assessable	21,823.75	
Special Fund	12,280.15	
Contract or Open Order Service—Assessable, etc	4,750.00	
Miscellaneous Accounts Receivable		4,050.83
	$59,998.45	$4,050.83

BUREAU OF SEWERS

Administration—		
Salaries—Superintendent, etc.	$ 9,280.00	
Supplies—Office, etc.	152.14	
Contract or Open Order Service—Repairs, etc.	103.34	
Equipment	15.00	
	$9,550.48	
Store Yards—		
Salaries—Labor, etc.	$ 6,585.76	
Supplies—General	3,906.60	
Contract or Open Order Service—Repairs, etc.	1,334.44	
Miscellaneous Accounts Receivable		362.37
	$11,826.80	$362.37
Cleaning and Flushing—		
Salaries—Labor, etc.	$ 29,986.36	
Supplies—General, etc.	383.77	
Material—General	5.00	
Contract or Open Order Service—Team Hire, etc.	7,114.07	
Fixed Charges—Rent	3,828.00	
Equipment—General	1,642.84	
Miscellaneous Accounts Receivable		1,273.00
	$42,960.04	$1,273.00
Repairs—		
Salaries—Labor, etc.	$ 16,580.62	
Material—Sewer, etc.	3,984.98	
Contract or Open Order Service—General Service	345.85	
	$20,911.45	

Construction—City—		
Labor and Material	$121,837.72	
	$121,837.72	
Construction—Contract—		
Concrete—Sewer	$ 36,192.02	
Pipe—Sewer	204,749.24	
Miscellaneous Accounts Receivable		6,939.89
	$240,941.26	6,939.89

BUREAU OF BRIDGES AND PUBLIC BUILDINGS

Administration—		
Salaries—Superintendent, etc.	$ 28,063.31	
Supplies—Office, etc.	1,030.36	
Minor Equipment—Drawings, etc	9.03	
Contract or Open Order Service—Repairs, etc.	2,962.42	
Equipment—Office, etc.	364.50	
Miscellaneous Accounts Receivable		.36
	$32,429.62	.36
Bridges and Viaducts—		
Salaries—Superintendence	$ 1,082.34	
Supplies—General	25.40	
Contract or Open Order Service—Storage, etc.	234.06	
	$1,341.80	
Operation—		
Salaries—Bridge Tenders, etc	$215,845.97	
Supplies—Fuel, etc.	4,353.00	
Minor Equipment—Tools, etc.	36.10	
Contract or Open Order Service—Light, Power, etc.	1,865.48	
Equipment	5,505.31	
	$227,605.86	
Maintenance—		
Salaries—Iron Workers, etc.	$ 55,178.91	
Supplies—Fuel, etc.	726.81	
Minor Equipment—Tools, etc	832.93	
Material—General	29,773.96	
Contract or Open Order Service—Repairs, etc.	1,322.45	
Special Fund—Bridge Repairs, etc.	33,447.56	
Special Fund—Roadway Replacement	22,741.76	
Special Fund—Sidewalk Replacement	1,765.61	
Special Fund—Piling and Abutment Repairs	15.86	
Special Fund—Bridge Painting	7,613.34	
Miscellaneous Accounts Receivable		61,452.33
	$223,419.19	61,452.33

City Hall—

Power and Heat—

Salaries—Engineer, etc.	$ 19,778.55	
Supplies—Fuel, etc.	30,091.11	
Minor Equipment—Tools, etc.	125.58	
Material—General	886 85	
Contract or Open Order Service—Repairs, etc.	3,085.46	
Special Fund	2,791.02	
	$56,758.57	

Electrical Service—

Salaries—Electrician, etc.	$ 7,708.39	
Supplies—General, etc.	835.51	
Minor Equipment—Tools, etc.	18.60	
Material—General	1,638.00	
Contract or Open Order Service	4.00	
Miscellaneous Accounts Receivable		2,244.09
	$10,204.50	2,244.09

Janitorial Service—

Salaries—Custodian, etc.	$ 36,351.41	
Supplies—Cleaning and disinfecting	911.99	
Minor Equipment—Tools, etc.	14.34	
	$37,277.74	

Elevator Service—

Salaries—Elevator Operators, etc.	$ 8,237.00	
Material—General	347.00	
Contract or Open Order Service—Repairs, etc.	538.15	
	$9,122.15	

Telephone Service—

Contract or Open Order Service—Telephone Service	$ 7,820.05	
Miscellaneous Accounts Receivable		1,098.62
	$7,820.05	1,098.62

General Service—

Salaries—Watchman, etc.	$ 1,925.00	
Supplies—General	957.55	
Minor Equipment—Tools, etc.	63.63	
Material—General	534.81	
Contract or Open Order Service—Repairs, etc.	5,368.23	
Special Fund—Treasurer's Office Remodeling	610.81	
Special Fund—Painting	2,043.45	
Miscellaneous Accounts Receivable		28,435.24
	$11,503.48	28,435.24

Natatoria—

Salaries—Superintendent, etc.	$ 53,609.08	
Supplies—General, etc.	26,747.96	
Minor Equipment—Tools, etc.	97.95	
Material—General	377.88	
Contract or Open Order Service—Repairs, etc.	21,900.20	
Fixed Charges—Insurance, etc.	15.19	
Equipment	16.00	
Miscellaneous Accounts Receivable		636.00
	$102,764.26	636.00

Bathing Beaches—

Salaries—Superintendent, etc.	$ 14,981.92	
Supplies—Fuel, etc.	2,301.93	
Minor Equipment—Tools, etc.	37.41	
Material—General	29.46	
Contract or Open Order Service—Repairs, etc.	1,001.48	
Fixed Charges—Bond, etc.	5 00	
Equipment—General	165.93	
Special Fund	72.61	
	$18,595.74	

Municipal Garage—

Salaries—Superintendent, etc.	$ 16,439.74	
Supplies—General, etc.	20,838.54	
Minor Equipment—Tools, etc.	200.43	
Material—General	4,054.92	
Contract or Open Order Service—Repairs, etc.	2,879.60	
Fixed Charges—Insurance, etc.	1,614.76	
Equipment—Motor Vehicle, etc.	14,702.05	
Special Fund	437.38	
Miscellaneous Accounts Receivable		46,522.36
	$61,167.42	46,522.36

Comfort Stations—

Supplies—Fuel, etc.	$ 120.20	
Contract or Open Order Service—General Service	841.16	
	$961.36	

Special Fund—

Rotary Fund	$ 13,899.59	
Miscellaneous Accounts Receivable		10,627.26
	$13,899.59	10,627.26

Construction—

Storehouse Bldg. (3rd Unit)	$ 125.33	
Isolation Hospital	26,777.22	
West Side Police Station	452.45	
Blue Mound Sanitarium	21,717.07	
Tuberculosis Division	3.50	
South Side Police Station	59.00	
North Avenue Bridge	117,036.80	
27th Street Viaduct	62,280.33	
5th Avenue Natatorium	2,572.64	
Market Shelters	298.00	
McKinley Park Bath House	15,900.33	
Central Market Scale Foundation	205.16	
Grand Ave. Comfort Station	257.12	
State Street Bridge	4.50	
16th Street Viaduct	.24	
Miscellaneous Accounts Receivable		3,255.8
	$247,689.69	3,255.8

BUREAU OF STREET CONSTRUCTION AND REPAIRS

Superintendence—

Salaries—Superintendent, etc.	$ 9,430.00	
Supplies—Office, etc.	336.23	
Contract or Open Order Service—Repairs, etc	2,621.84	
Equipment—Office, etc.	46.30	
	$12,434.37	

Testing Laboratory—

Salaries—Chemists, etc.	$ 4,330.00	
Supplies—Laboratory, etc.	104.48	
Minor Equipment—Apparatus, etc.	88.14	
Contract or Open Order Service—Repairs, etc.	39.26	
Equipment	149.68	
	$4,711.56	

Pavement Repairs—

Salaries—Foremen, etc.	$ 16,517.50	
Supplies—General, etc.	536.66	
Minor Equipment—Tools, etc	271.65	
Contract or Open Order Service—Repairs, etc.	3,540.63	
Equipment—General, etc.	13,210.36	
Special Fund	235,613.61	
Miscellaneous Accounts Receivable		29,370.2
	$269,690.41	29,370.2

Repair Shop—

Salaries—Foremen, etc.	$ 5,227.50	
Supplies—Fuel, etc.	190.21	
Minor Equipment—Tools, etc.	128.81	
Contract or Open Order Service—General	166 88	
Equipment—General	817.00	
Miscellaneous Accounts Receivable		817.0
	$6,530.40	817.0

Rotary Fund—

Special Fund—General	$ 22,925.29	
Miscellaneous Accounts Receivable		21,752.68
	$22,925.29	21,752.68

Construction—

Special Fund	$ 30,042.74	
Asphalt Pavement	175,851.24	
Concrete Pavement	320,680.03	
Stone Block Pavement	211,221.69	
Sidewalks	45,739.86	
Miscellaneous Accounts Receivable		733.42
	$783,535.56	733.42

Sidewalk Repairs and Replacements—

Special Fund	$ 50,788.23	
Miscellaneous Accounts Receivable		4,533.27
	$50,788 23	4,533.27

BUREAU OF RIVERS AND HARBORS

Harbor Commission—

Salaries—Secretary	$ 2,705.00	
Supplies—Office	9.53	
Contract or Open Order Service—Postage, etc.	17.35	
	$2,731.88	

Harbor Master—

Salaries—Harbor Master	$ 1,865.00	
Contract or Open Order Service—Repairs, etc.	9.10	
	$1,874.10	

Docking and Dredging—

Salary—Inspection	$ 1,736.00	
Dredging	30,659.66	
	$32,395.66	

Harbor Improvements—

Special Fund	$120,161.21	
	$120,161.21	

MISCELLANEOUS

House Drains and Water Connections—

Connections	$ 71,670.90	
	$71,670.90	

City Property—

Rents Received		13,016.85
		$13,016.85

BUREAU OF ILLUMINATION

General Office—		
Salaries—Engineer, etc.	$ 13,975.00	
Supplies—General	102.91	
Contract or Open Order Service—General	37.85	
Equipment	190.00	
	$14,305.76	
Laboratory—		
Salaries	$ 2,465.00	
Supplies—General	9.95	
Contract or Open Order Service—General	37.68	
Equipment	1,061.26	
	$3,573.89	
Storehouse—		
Supplies—General	$ 71.32	
Contract or Open Order Service—General	830.01	
Fixed Charges—Rent, etc.	1,760.00	
	$2,661.33	
Street Lighting Operation—		
Contract or Open Order Service—Operation	$280,478.59	
Miscellaneous Accounts Receivable		251.7
	$280,478.59	251.7
Street Lighting Maintenance—		
Salaries	$ 34,196.18	
Supplies—General	20,089.31	
Minor Equipment—Tools, etc.	503.03	
Contract or Open Order Service—Repairs, etc.	2,490.49	
	$57,279.01	
Construction—		
Special Fund	$ 7,326.52	
	$7,326.52	
Miscellaneous Service—		
Safety Isle—Maintenance	$ 3,863.26	
Safety Isle—Construction	5,327.88	
Market Lighting	26.66	
Special Lighting	1,651.71	
Miscellaneous Accounts Receivable		1,385.1
	$10,869.51	1,385.1
Electric Light Plant—		
Gas and Electric Extensions	$633,188.95	
Miscellaneous Accounts Receivable		8,016.3
	$633,188.95	8,016.3

List of Contracts

Awarded by

the

Department of Public Works

During the Year 1920

LIST OF CONTRACTS AWARDED BY THE DEPARTMENT OF PUBLIC WORKS DURING 1920

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
5	Mar. 6, 1920	Otto Bodemann	Cutting, filling, cement concrete, on alleys between 39th and 40th Streets, Cherry and Galena Streets, in the 19th Ward	$ 3,836.80
6	Mar. 6, 1920	Otto Bodemann	Cutting, filling, cement concrete, on alley between 29th and 30th Streets, Burleigh and Auer Ave., in the 20th Ward	2,965.00
7	Mar. 18, 1920	Otto Bodemann	Cutting, filling, cement concrete, on alley between 52nd and 53rd Streets, Vine and Pabst Ave., in the 19th Ward	2,275.25
8	Mar. 18, 1920	Otto Bodemann	Cutting, cement concrete alley bet. 55th and 56th Streets, Elm and North Ave., 22nd Ward	2,601.75
9	Mar. 18, 1920	Otto Bodemann	Cutting, filling, cement concerete, alley bet. 56th and 57th Streets, Elm and North Ave., 22nd Ward	2,259.50
10	Mar. 18, 1920	Otto Bodemann	Cutting, filling, cement concrete on alley bet. 57th and 58th Sts., Elm and Past Ave., 22nd Ward	3,443.25
12	Mar. 27, 1920	F. P. Caughlin Co. (Assigned to White Const. Co.)	Filling, old pavement removed, asphalt, brick gutter, new limestone curb, old limestone curb reset, on Wells Street, from the west line of 24th Street, to the west line of 26th Street, 16th Ward	13,380.71
13	Mar. 26, 1920	Badger Construction Co	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks on Elm Street, from W. L. of 57th Street, to E. L. of 58th Street, 22nd Ward	3,851.40
14	Mar. 26, 1920	Badger Construction Co	Asphalt removed, asphalt paving, cement curb and gutter, old cement curb and gutter reset, on 39th Street, from N. L. of North Ave., to S. L. of Clarke Street, in the 22nd Ward	15,603.00
16	Apr. 12, 1920	White Construction Co	Cutting, filling, asphalt, cement curb and gutter, 9th Ave., from Dakota Street to a point 558 ft. north of Dakota Street, in the 14th Ward	7,095.24
17	Mar. 27, 1920	F. P. Caughlin Co. (Assigned to White Const. Co.)	Cutting, asphalt, cement curb and gutter, cement sidewalks, Concordia Ave., from W. L. of 20th Street, to E. L. of 21st Street, in the 20th Ward	5,266.35
18	Mar. 27, 1920	F. P. Caughlin Co. (Assigned to White Const. Co.)	Old pavement removed, asphalt, comb. cement curb and gutter, on Wright Street, from W. L. of 39th Street, to E. L. of Sherman Blvd., 22nd Ward	11,454.15
19	Mar. 27, 1920	F. P. Caughlin Co. (Assigned to White Const. Co.)	Present pavement removed, asphalt, comb. curb and gutter, cement gutter, on Meinecke Ave., from W. L. of 39th Street to E. L. of Sherman Blvd., 22nd Ward	10,710.00

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
20	Mar. 27, 1920.....	F. P. Caughlin Co (Assigned to White Const. Co.).....	Old asphalt and base removed, asphalt, Lt. Traf. asphalt, comb. cement curb and gutter, old comb. curb rem. on 40th Street, from N. L. North Ave. to S. L. of Center Street, 22nd Ward..	24,564.48
23	Apr. 12, 1920.....	Badger Construction Co.....	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks on Cherry Street, from 54th Street to Hawley Road, 19th Ward.....	5,929.54
24	Apr. 19, 1920.....	Retzlaff, Froemming & Bluhm..	Cement concrete, on Wright Street, from Bolton Street to Dousman Street, in the 13th Ward.....	2,494.24
25	Apr. 10, 1920.....	Albert H. Prange.....	Cutting, old pavement removed, granite on 8 in. conc. foundation, new straight limestone curb, old curb reset, on Cape street, from Ship Street to Walnut Street, in the 6th Ward..	14,999.94
26	May 1, 1920.....	White Construction Co.....	Cutting, asphalt, comb. cement curb and gutter, cement sidewalks, on American Ave., from S. L. of Dakota Street to S. L. of Manitoba Street, 14th Ward.....	10,675.26
28	May 1, 1920.....	White Construction Co.....	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, 58th Street, from S'ly. line of Elliott Circle to the N. L. of Pabst Ave., 22nd Ward.....	7,852.99
29	May 1, 1920.....	White Construction Co.....	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, on 59th Street, from S. L. of North Ave. to N'ly. L. of Elliott Circle, 22nd Ward.....	5,238.11
30	May 1, 1920.....	White Construction Co.....	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, on 59th Street, from N. L. of Pabst Ave. to S'ly. L. of Elliott Circle, 22nd Ward.....	7,021.48
31	May 1, 1920.....	White Construction Co.....	Filling, brick pavement removed, asphalt, brick gutter, Florida Street, from W. L. of Clinton Street, to E. C. L. of Reed Street, 5th Ward	9,544.54
32	Apr. 12, 1920.....	Badger Construction Co.....	Cutting, filling, asphalt, comb. cement curb and gutter, old curb removed, cement sidewalks, old cement sidewalks removed, Herbert Street, from W. L. of 22nd Street, to E. L. of West 24th Street, 20th Ward.....	15,713.75
33	May 1, 1920.....	White Construction Co.....	Cutting, filling, old pavement removed, asphalt, brick gutter concrete retaining wall, new straight limestone curb, old straight limestone curb reset, new radius limestone curb, cement sidewalks removed, on Jefferson Street, from N. C. L. of Biddle Street to the S. C. L. of Juneau Ave., in the 3rd Ward..	12,906.30

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
34	May 1, 1920	White Construction Co.	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, Windsor avenue, from E. L. of Spring Ave. (60th Street) to the W'ly. L. of Elliott Circle, 22nd Ward	3,474.10
50	May 11, 1920	Milwaukee Gen'l Const. Co.	Cutting, filling, o'd stone pavement removed, new granite block pavement on Canal Street, from Muskego Ave. to 20th Street, 23rd Ward	72,839.05
51	May 11, 1920	Milwaukee Gen'l Const. Co.	Cutting, filling, old pavement removed, cement concrete, on alley between 12th and 13th Streets, Wells and Cedar Streets, in the 4th Ward	1,584.04
52	May 13, 1920	Frank Banaszak	Filling, old pavement removed, cement concrete, on alley bet. Washington, Scott, Hanover and Reed Streets, in 5th Ward	2,164.23
53	May 8, 1920	Blodgett-Clayton Const. Co.	Filling, old cobble stone pavement removed, cement concrete, on North alley bet. 23rd and 24th Streets, Walnut and Vine Streets, 9th Ward	1,585.58
54	May 8, 1920	Blodgett-Clayton Const. Co.	Cutting, old pavement removed, cement concrete, on North alley running east and west and alley running north and south bet. 20th and 21st Streets, Vliet and Cherry Streets, 9th Ward	2,538.54
55	May 11, 1920	Retzlaff, Froemming & Bluhm	Cutting, cement concrete, north and south alley bet. 12th and 13th Streets, Fond du Lac Ave. and Sherman Streets, in the 10th Ward	1,767.50
56	May 8, 1920	Bloodgett-Clayton Const. Co.	Cutting, cement concrete, south alley bet. 24th and West West 24th Streets, Lloyd and Elm, 10th Ward	1,255.56
57	May 8, 1920	Bloodgett-Clayton Const. Co.	Cutting, cement concrete, on alley bet. 20th and 21st Streets, Elm Street and Fond du Lac Ave., in the 10th Ward	1,394.46
58	May 7, 1920	Ryback & Sadowski	Cutting filling, cement concrete, on alley bet. 20th and 21st Aves., Lapham and Mitchell Streets, in the 11th Ward	6,474.35
59	May 7, 1920	Ryback & Sadowski	Cutting, cement concrete, alley bet. 25th and 26th Aves., Orchard and Lapham Streets, 11th Ward	3,727.95
60	May 7, 1920	Ryback & Sadowski	Cutting, cement concrete, on alley bet. 26th and 27th Aves., Lapham and Mitchell Streets, 11th Ward	3,673.55
61	May 8, 1920	Blodgett-Clayton Const. Co.	Cutting, cement concrete, on alley bet. Fratney and North Pierce Streets, Wright and Clarke Streets, 13th Ward	4,224.75
62	May 8, 1920	Blodgett-Clayton Const. Co.	Cutting, filling, old cobblestone pavement removed, cement concrete, alley bet. Booth and Holton, North Ave. and Lee Streets, 13th Ward	3,983.16

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
63	May 8, 1920	Blodgett-Clayton Const. Co	Cutting, filling, cement concrete, alley bet. Lisbon Ave. and Vine Streets, 25th and 26th Streets, in the 19th Ward	1,376.70
64	May 8, 1920	Blodgett-Clayton Const. Co	Cutting, old pavment removed, cement sidewalks removed, cement concrete, alleys bet. Lisbon Ave., Pabst Ave., and 41st Street, in the 19th Ward	2,038.32
65	May 8, 1920	Blodgett-Clayton Const. Co	Cutting, old brick pavement removed, cement concrete, alley bet. 38th and 40th Streets, Roberts and Walnut Streets, in the 19th Ward	2,576.45
66	May 8, 1920	Blodgett-Clayton Const. Co	Cutting, filling, old present pavement removed, cement concrete, alley bet. 37th and 38th Streets, Brown Street and Pabst Ave., in the 19th Ward	2,606.92
67	May 8, 1920	Blodgett-Clayton Const. Co	Cutting, old cement walks removed, new coment walks, cement concrete, alleys bet. 33rd and 34th Streets, Center and Hadley Streets, 20th Ward	3,099.24
68	May 8, 1920	Michael Switalski	Cutting, cement concrete, alleys running east and west, and the center 20 ft. of alley running north and south bet. 27th and 28th Streets, Auer and Concordia Aves., 20th Ward	5,349.15
69	May 8, 1920	Michael Switalski	Cutting, new cement walks, cement concrete, center 20 feet of alley bet. 27th and 28th Streets, Locust and Chambers Streets, 20th Ward	3,529.46
70	May 11, 1920	Retzlaff, Froemming & Bluhm	Cutting, filling, cement concrete, alley running east and west and center 20 feet of alley running north and south, bet. 26th and 27th Streets, Auer and Concordia Aves., in 20th Ward	4,934.88
71	May 11, 1920	Milwaukee Gen'l Const. Co	Cutting, filling, old pavement removed, cement concrete, alley bet. Walker Street, National Ave. and 10th and 11th Aves., 23rd Ward	1,835.18
72	May 13, 1920	Frank Banaszak	Cutting, filling, cement concrete, alley bet. 32nd and 33rd Aves., National Ave. and South Pierce Street, 23rd Ward	3,474.14
73	May 7, 1920	Ryback & Sadowski	Cutting, filling, cement concrete, alley bet. Layton Blvd., 21st Ave., Grant and Becher Streets, in the 24th Ward	4,520.00
74	May 8, 1920	Dean Construction Co	Filling, old pavement removed, cement concrete, north alley bet. 12th Street, Sheridan Lane, Vliet and Cherry Streets, in 9th Ward	941.50
75	May 17, 1920	White Construction Co	Cutting, asphalt, combination cement curb and gutter, old radius curb removed, on South Pierce and Shea Ave. from the E. L. of 15th Ave. to the E. C. L. of 27th Ave., in the 23rd Ward	70,007.62

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
76	May 11, 1920	Blodgett-Clayton Const. Co.	Cutting, filling, cement concrete, on alley bet. 11th and 12th Streets, Concordia Ave. and Davis Street, 25th Ward	5,931.96
77	May 11, 1920	Blodgett-Clayton Const. Co.	Cutting, filling, cement concrete, alley between 8th and 9th Streets, Ring Street and Concordia Ave., in the 25th Ward	1,864.65
78	May 11, 1920	Blodgett-Clayton Const. Co.	Cutting, filling, cement concrete, alley bet. 8th and 9th Streets, Concordia Ave. and Davis Street, 25th Ward	4,695.05
79	May 12, 1920	Retzlaff, Froemming & Bluhm.	Cutting, old pavement removed, old stone curb removed, old cement sidewalks removed, cement concrete, on alleys between Louis Ave., 14th Street, Burleigh and Ring Streets, 25th Ward.	8,280.31
80	May 11, 1920	Blodgett-Clayton Const. Co.	Cutting, cement concrete, alley bet. 11th and 12th Streets, Burleigh and Ring Streets, 25th Ward	7,153.45
81	May 20, 1920	Albert H. Prange	Cutting, old pavement removed, granite paving, new limestone curb, old limestone curb reset, on Cape Street, from N. L. of Cherry Street to N. L. of Ship Street, 6th Ward	18,447.10
82	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, concrete, center 20 feet of alley bet. 28th and 29th, Locust and Chambers Streets, 20th Ward	4,169.80
83	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, cement concrete, center 20 feet of alley bet. 29th, 30th, Locust and Chambers Streets, 20th Ward	4,486.20
84	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, old pavement removed, concrete, center 20 feet of alley bet. 28th, 29th, Chambers and Burleigh Streets, 20th Ward	4,205.92
85	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, filling, concrete, alleys running E. and W. and center 20 feet of alley running N. and S., bet. 24th, West 24th, Burleigh and Auer Ave., 20th Ward	4,748.25
86	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, brick pavement removed, concrete, center 20 feet of alley bet. 27th and 28th, Burleigh and Chambers Streets, 20th Ward	4,459.80
87	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, old pavement removed, concrete, center 20 feet of alley bet. 28th, 29th, Hadley and Locust Streets, in the 20th Ward.	4,330.80
88	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, concrete, alley bet. 40th, 41st, Chambers and Burleigh Streets, 20th Ward	2,857.64
89	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, old pavement removed, concrete, center 20 feet of alley bet. 27th, 28th, Hadley and Locust Streets, in the 20th Ward.	4,019.76
90	May 28, 1920	Retzlaff, Froemming & Bluhm.	Cutting, concrete, alley bet. 41st, Grant Blvd., Hadley and Locust Streets, 20th Ward	3,605.02

UNIVERSITY OF ILLINOIS LIBRARY APR

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
91	May 27, 1920	Otto Bodemann	Cutting, filling, concrete, alley bet. 37th, 38th Streets, Hadley and Locust Streets, 20th Ward	2,839.60
92	May 27, 1920	Otto Bodemann	Cutting, filling, concrete, alley bet. 38th, 39th, Locust and Chambers Streets, 20th Ward	2,915.50
93	May 27, 1920	Otto Bodemann	Cutting, filling, concrete, alley bet. Grant and Sherman Blvds., Hadley and Locust Streets, 20th Ward	3,342.10
94	May 27, 1920	Otto Bodemann	Cutting, filling, concrete, alley bet. 38th, 39th, Hadley and Locust Streets, in the 20th Ward	2,876.85
95	May 29, 1920	Ryback & Sadowski	Cutting, filling, concrete, alley bet. 26th and 27th Aves., Becher and Grant Streets, 24th Ward	3,721.80
120	June 21, 1920	F. P. Caughlin Co	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, Maryland Ave., from S. L. of Newport Ave. to Edgewood Ave., 18th Ward	25,752.40
121	June 21, 1920	F. P. Caughlin Co	Grading, asphalt, new radius curb, old curb reset, brick gutter, Intersection of Van Buren and Mason Streets, 3rd Ward	2,549.28
122	June 18, 1920	Froemming Brothers	Cutting, filling, old cobblestone pavement removed, cement concrete, alley bet. 4th, 5th, Galena and Walnut Streets, 6th Ward	4,564.18
123	June 17, 1920	Dean Construction Co	Cutting, cement concrete, alley bet. 33rd and 34th, Lisbon Ave. and Vine Street, 19th Ward	1,838.75
124	July 7, 1920	Bodemann Construction Co	Cutting, filling, cement curb and gutter removed, cement sidewalks removed, cement concrete, alley bet. 17th, 18th, Davis Street and Finn Place, in the 25th Ward	1,243.90
125	July 13, 1920	White Construction Co	Cutting, asphalt, comb. cement curb and gutter, cement sidewalks, Ontario Street, from Superior to Beulah Ave., 17th Ward	7,040.50
126	June 28, 1920	Badger Construction Co	Cutting, asphalt, brick gutter, new straight limestone curb, old straight limestone curb reset, new radius curb, on Sixteentn Street, from N. L. of Vliet Street, to the S'ly L. of Fond du Lac Ave., in the 9th Ward	47,632.51
127	July 13, 1920	White Construction Co	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, on 17th Street, from S. L. of Mendel's Subd., to S. L. of Davis Street, 25th Ward	7,151.75
128	July 13, 1920	White Construction Co	Old surface and brick gutter removed, asphalt, brick gutter, repaved, cement sidewalks removed and replaced, new straight limestone curb, old straight limestone curb reset, on Wells Street, from W. L. of 33rd Street to E. L. of 35th Street, in the 10th Ward	5,008.69

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
129	July 14, 1920	Frank Banaszak	Cutting, filling, cement concrete, alley bet. East Water, Market, Knapp and Juneau Ave., 3rd Ward	1,500.65
130	July 1, 1920	Michael Switalski	Cutting, filling, cobblestone pavement removed, cement concrete, alley bet. 16th, 17th, Clybourn Streets, and Grand Ave., 4th Ward	1,968.00
131	July 6, 1920	Retzlaff, Froemming & Bluhm	Cutting, cement concrete, alley bet. Sherman, Walnut, 10th and 11th Streets, in the 10th Ward	1,521.40
132	July 6, 1920	Retzlaff, Froemming & Bluhm	Cutting, filling, old cobblestone removed, cement concrete, alley bet. 10th, 11th, Vine and Harmon Streets, in 10th Ward	1,556.00
133	July 14, 1920	Frank Banaszak	Cutting, filling, cement concrete, alley bet. 5th, 6th, Hayes and Arthur Aves., in the 14th Ward	3,287.20
134	July 14, 1920	Frank Banaszak	Cutting, cement concrete, alley bet. Arthur, Harrison, 10th and American Aves., 14th Ward	3,046.96
135	July 2, 1920	R. H. Gumz	Cutting, filling, cement concrete, alley bet. Arthur, Harrison, 3rd and 4th Aves., 14th Ward	5,121.00
136	July 6, 1920	Blodgett-Clayton Const. Co.	Cutting, cement concrete, alley bet. 26th, 27th, State and Cedar Streets, in the 15th Ward	2,585.37
137	July 1, 1920	Michael Switalski	Cutting, old brick pavement, brick pavement removed and replaced, removing 2-14 in. trees, cement concrete, alley bet. 34th, 35th, Clybourn and St. Paul Ave., 16th Ward	3,015.40
138	July 22, 1920	Dean Construction Co.	Cutting, cement walks removed and replaced, old pavement removed, cement concrete on alley bet. 30th and 31st Streets, St. Paul Ave. and Clybourn Street, in the 16th Ward	2,594.10
139	July 1, 1920	Michael Switalski	Cutting, filling, old pavement removed, cement concrete, alley, bet. 32nd, 33rd, Park Hill and Mt. Vernon Aves., 16th Ward	2,961.15
140	July 7, 1920	Bodemann Con. Co.	Cutting, cement concrete, alley, bet. 39th and 40th Streets, Clarke and Center Streets, 22nd Ward	3,431.65
141	July 7, 1920	Bodemann Construction Co.	Cutting, old cement walks removed, new cement walks, cement concrete alley bet. 47th and 48th Streets, Elm Street and North Ave., 22nd Ward	2,327.00
142	July 6, 1920	Blodgett-Clayton Const. Co.	Cutting, old cement walks removed, old curb and gutter removed, new cement walks, new curb and gutter, cement concrete, alley bet. 38th, 39th, Clarke and Center Streets, in the 22nd Ward	2,170.39
143	July 22, 1920	Dean Construction Co.	Cutting, filling, cement concrete, alley bet. 57th and 58th Streets, Elm and North Ave., 22nd Ward	3,301.00

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
144	July 6, 1920	Blodgett-Clayton Const. Co	Cutting, cement concrete, alley bet. 26th and 28th Aves., Madison and Greenfield Ave., 23rd Ward	2,424.22
145	July 14, 1920	Frank Banaszak	Cutting, filling, old pavement removed, cement concrete, alley bet. 17th and 18th Aves., South Pierce and National Aves., 23rd Ward	1,762.20
146	July 1, 1920	Michael Switalski	Cutting, filling, cement concrete, alley bet. 14th, 15th, Davis and Finn Place, 25th Ward	3,070.65
147	July 7, 1920	Bodemann Construction Co	Cutting, cement concrete alley bet. 9th and 10th Streets, Ring and Concordia Ave., 25th Ward	2,716.60
148	July 7, 1920	Bodemann Construction Co	Cutting, cement concrete, alley bet. 10th and 11th Streets, Ring and Concordia Ave., 25th Ward	2,424.95
149	July 7, 1920	Bodemann Construction Co	Cutting, filling, cement concrete, alley bet. 12th Street, Louis Ave., Ring and Concordia Ave., 25th Ward	2,520.75
150	July 7, 1920	Bodemann Construction Co	Cutting, cement concrete, alley bet. 14th, 15th Streets, Ring and Concordia Ave., 25th Ward	1,712.70
170	July 12, 1920	White Construction Co	Filling, old pavement removed, asphalt, brick gutter paving, paving, new limestone curb, old limestone curb reset, new radius curb, Mitchell Street, from W. L. of Kinnickinnic Ave., to a point 114 feet west of W. L. of 7th Ave., 8th and 12th Ward	88,756.65
197	Aug. 14, 1920	Frank Banaszak	Cutting, new cement sidewalks, north side of Atkinson Ave., from Green Bay Ave. to 11th Street, in the 25th Ward	1,486.64
198	Aug. 20, 1920	Michael Switalski	Cutting, filling, granite blocks, new straight limestone curb, new radius limestone curb, cement sidewalks, Cawker Place, from W. L. of 30th Street, to right-of-way C. M. & St. P. Ry., 20th Ward	12,252.75
199	Aug. 20, 1920	Manger Construction Co	Cutting, (no compensation for filling) on Humboldt Ave., from Keefe Ave. to Lake Street, 21st Ward	7,152.36
200	Aug. 17, 1920	Frank Doherty Company	Cutting, filling, Locust Street, from W. C. L. of 39th Street, to the east line of Sherman Blvd., 20th Ward	1,358.28
201	Sept. 11, 1920	White Construction Co	Cutting, filling, old brick pavement removed, brick pavement replaced, asphalt, brick gutter, comb. cement curb and gutter, straight limestone curb, radius limestone curb, cement sidewalks on Marshall Street, from Michigan Street to S. L. of Wisconsin Street, 3rd Ward	13,966.18

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
202	Aug. 12, 1920	Froemming & Radtke	Cutting and filling, on 7th Street, from Green Bay Ave. to Lake Street, 21st Ward	6,067.20
203	Aug. 19, 1920	Froemming & Radtke	Cutting and filling on Sherman Blvd., from the north line of Center Street to the S. C. L. of Burleigh Street, 20th Ward	23,571.27
204	Sept. 11, 1920	White Construction Co	Cutting, filling, removing pavement, asphalt, brick gutter, straight limestone curb, old limestone curb reset, new radius limestone curb, cement sidewalks, on Wisconsin Street, from the W. L. of Marshall Street to right-of-way of Railway Company, 3rd Ward	11,033.51
205	Aug. 30, 1920	Kehrein Construction Co	Cutting, filling, old cobblestones removed, cement concrete, alley bet. 13th and 14th Streets, Cedar and State Streets, 2nd Ward	2,747.36
207	Aug. 17, 1920	A. J. Koehn & Company	Cutting, removing present pavement, cement concrete, alley bet. 32nd and 33rd Streets, Galena and Walnut Streets, 19th Ward	2,521.10
208	Aug. 10, 1920	Bodemann Construction Co	Cutting, cement sidewalks removed and replaced, old pavement removed, cement concrete, alley bet. 32nd and 33rd Streets, Cherry and Galena Streets, 19th Ward	2,356.65
209	Aug. 10, 1920	Retzlaff, Froemming & Bluhm	Cutting, removing present old pavement, cement concrete, alley bet. 35th and 37th Streets, Vliet and Cherry Streets, 19th Ward	3,275.42
210	Aug. 10, 1920	Bodemann Construction Co	Cutting, filling, cement concrete, alley bet. 20th and 21st Streets, Locust and Chambers Streets, 20th Ward	3,093.00
211	Aug. 10, 1920	Bodemann Construction Co	Cutting, cement concrete, alley bet. 24th and West 24th Streets, Locust and Chambers Streets, 20th Ward	3,067.35
212	Aug. 10, 1920	Retzlaff, Froemming & Bluhm	Cutting, cement concrete, alley bet. West 24th and 25th Streets, Hadley and Locust Streets, 20th Ward	4,799.03
213	Aug. 10, 1920	Retzlaff, Froemming & Bluhm	Cutting, filling, cement concrete, alley bet. 25th and 26th Streets, Burleigh and Auer Ave., 20th Ward	5,335.33
214	Aug. 10, 1920	Retzlaff, Froemming & Bluhm	Cutting, removing old pavement, cement concrete, alley bet. 29th and 30th Streets, Chambers and Burleigh Streets, 20th Ward	4,702.01
215	Aug. 10, 1920	Bodemann Construction Co	Cutting, filling, cement concrete, alley between 47th and 48th Streets, North and Meinecke Aves., 22nd Ward	4,084.50
225	Aug. 23, 1920	Badger Construction Co	Cutting, filling, asphalt, comb. cement curb and gutter, cement sidewalks, 47th Street, from the S. C. L. of Meinecke Ave., to the S. L. of Center Street, 22nd Ward	38,153.54

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
226	Sept. 11, 1920	White Construction Co.	Cutting, filling, asphalt, brick gutter, straight limestone curb, radius curb, cement sidewalks on Richards Street, from Franklin Street, to south line of Lake Street, 21st Ward	38,307.53
227	Aug. 19, 1920	Froemming Brothers	Cutting, filling, cobblestone pavement removed, cement concrete, alley bet. 1st and 2nd Streets, Sherman and Reservoir Ave., 6th Ward	3,027.20
228	Aug. 19, 1920	Froemming Brothers	Cutting, filling, cobblestone removed, cement concrete, alley bet. 5th and 6th Streets, Cherry and Galena Streets, 6th Ward	5,225.20
229	Aug. 19, 1920	Froemming Brothers	Cutting, filling, cobblestones removed, cement concrete, alley bet. 5th and 6th Streets, Walnut and Sherman Streets, 6th Ward	2,747.00
230	Aug. 19, 1920	Retzlaff, Froemming & Bluhm	Cutting, cement concrete, alley, bet. 6th and 7th Streets, Galena and Walnut Streets, 6th Ward	2,927.75
231	Aug. 19, 1920	Froemming Brothers	Cutting, filling, cobblestones removed, cement concrete, alley bet. 8th and 9th Streets, Garfield and North Aves., in 6th Ward	2,050.40
232	Aug. 19, 1920	Froemming Brothers	Cutting, filling, cobblestones removed, cement concrete, alley bet. 8th and 9th Streets, Harmon and Lloyd Streets, 6th Ward	2,380.20
249	Sept. 28, 1920	Frank Banaszak	Cutting filling, cement sidewalks, Arthur Ave., bet. 28th and 30th Aves., in the 24th Ward	1,679.80
250	Sept. 28, 1920	Frank Banaszak	Cutting, filling, cement sidewalks, north side of Pabst Ave., bet. Western and 28th Aves., 24th Ward	1,161.71
251	Sept. 24, 1920	Retzlaff, Froemming & Bluhm	Cutting, filling, concrete paving (Integral Curb), cement sidewalks, 2nd Street, bet. N. L. of Keefe Ave. and the S. L. of Vienna Ave., 21st Ward	18,645.12
252	Sept. 28, 1920	Frank Banaszak	Comb. cement curb and gutter, cement sidewalks, east side of 27th Ave., from Lincoln Ave. to Burnham Street, and on the west side of 27th Ave., from Lincoln Ave. to a point 120 feet N. of Lincoln Ave., in the 11th and 24th Wards	3,765.64
253	Sept. 28, 1920	Frank Banaszak	Cutting, filling, old pavement removed, cement concrete, alley bet. Greenbush and Grove Streets, Virginia and Florida Streets, 5th Ward	2,070.05
254	Sept. 24, 1920	Diamond "C" Const. Co.	Cutting, filling, old pavement removed, cement concrete alley, running north and south bet. 10th and 11th Streets, Harmon and Lloyd Streets, 10th Ward	2,381.45
255	Sept. 24, 1920	Retzlaff, Froemming & Bluhm	Cutting, cement concrete, on alleys bet. Stanley Street, Humboldt Ave., Walworth and Lee Streets, 18th Ward	3,552.00

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
256	Sept. 21, 1920	Bodemann Construction Co.	Cutting, filling, cement concrete, alley bet. 14th and Fifteenth Streets, Nash and Atkinson Ave., 25th Ward	2,889.25
257	Sept. 21, 1920	Bodemann Construction Co.	Cutting, cement concrete, alley running east and west bet. 14th and 15th Streets, Burleigh and Ring Streets, 25th Ward.	1,633.80
258	Oct. 1, 1920	Ryback & Sadowski	Cutting, cement concrete, alley bet. 40th and 41st Streets, Locust and Chambers Streets, 20th Ward	2,952.44
260	Nov. 1, 1920	Kehrein Construction Co.	Cutting, filling, cement concrete, on alleys bet. 19th and 20th Streets, Loyd and Elm Streets, and Fond du Lac Ave., in the 10th Ward	2,773.33
261	Nov. 9, 1920	White Construction Co.	Cutting, asphalt, brick gutter, new straight limestone curb, new radius limestone curb, old curb reset, Becher Street, from 2nd Ave. to Windlake Ave., in the 8th Ward	33,205.69
262	Oct. 28, 1920	Badger Construction Co.	Cutting, filling, comb. cement curb and gutter asphalt, side walks on Center Street, from Sherman Blvd., to 51st Street, 20th and 22nd Wards	71,493.86
263	Oct. 28, 1920	Badger Construction Co.	Cutting, filling, old pavement removed, asphalt comb. cement curb and gutter, old curb removed, Chambers Street, from 35th Street to a Point 141 feet west of 35th Street, 20th Ward.	2,198.69
264	Oct. 30, 1920	Froemming Brothers	Cutting, filling, cement concrete, sidewalks, 11th Street, from Atkinson Ave. to Lake Street, 25th Ward	25,635.00
265	Nov. 3, 1920	Kroening Construction Co.	Cutting, filling, cement concrete, cement sidewalks, 15th Street, from Atkinson Ave. to Lake Street, in the 25th Ward	13,783.11
266	Nov. 3, 1920	Kroening Construction Co.	Cutting, filling, cement concrete, sidewalks on 14th Street, from Atkinson Ave. to Lake Street, 25th Ward	13,807.29
267	Oct. 30, 1920	Froemming Brothers	Cutting, filling, asphalt pavement removed and replaced, cement concrete, radius curb and cement sidewalks on Fratney Street, from Keefe Ave. to Franklin Street, 21st Ward	19,429.25
268	Oct. 27, 1920	Frank Schomann	Cutting, filling, sidewalks, Hayes Ave., from 28th to 30th Aves., 24th Ward	1,954.00
269	Nov. 3, 1920	Kroening Construction Co.	Old pavement removed, new sandstone paving, new straight limestone curb, new radius limestone curb, old curb reset, Kinnickinnic Ave., from Mitchell Street, to South Bay Street, 12th Ward	48,863.51
270	Oct. 30, 1920	Froemming Brothers	Cutting, filling, cement concrete, sidewalks, 9th Street, from N. L. of Graham Street, to a Point 20 feet south of the N. L. of Somer's Subd. No. 1, 25th Ward	17,557.34

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
271	Oct. 26, 1920	Albert H. Prange	Old pavement removed, sandstone paving, straight limestone curb, old straight limestone curb reset, radius curb, on 7th Street, from Vliet Street to the S. L. of Galena Streets, 6th Ward	15,155.96
272	Nov. 3, 1920	Kroening Construction Co	Cutting, filling, cement concrete, sidewalks, 10th Street, from N. L. of Graham Street to the S. L. of Lake Street, 25th Ward	23,352.57
273	Nov. 3, 1920	Kroening Construction Co	Cutting, filling, cement concrete, sidewalks, on 12th Street, from S'ly L. of Atkinson Ave. to S. L. of Lake Street, 25th Wd.	22,710.93
274	Oct. 27, 1920	Frank Schomann	Cutting, filling, cement sidewalks, 28th Ave., from Lincoln Ave. to Pabst Ave., 24th Ward	4,528.75
275	Oct. 27, 1920	Frank Schomann	Cutting, filling, cement sidewalks, 29th Ave., from Pabst Ave. to Lincoln Ave., 24th Ward	8,119.00
276	Oct. 27, 1920	Frank Schomann	Cutting, filling, cement sidewalks, Western Ave., from Pabst Ave. to Lincoln Ave., 24th Ward	3,753.50
4	Mar. 17, 1920	Rodger Taylor	To keep the Public Comfort Station on Sixth Street Viaduct, near Canal Street	550.00
43	Apr. 29, 1920	Emil Grether	Concrete and cement work for alterations and additions, McKinley Beach Bath House	2,267.00
42	May 15, 1920	A. H. Hecker	Lockers for additions and alterations at McKinley Beach Bath House	8,031.25
44	Apr. 24, 1920	Benj. Van Echteren	Carpenter work for additions and alterations at McKinley Beach Bath House	7,354.00
45	Apr. 28, 1920	H. E. Schaetzke	Galvanized iron and tin work for additions and alterations at McKinley Beach Bath House	222.00
46	Apr. 29, 1920	S. V. Hanley	Plumbing and sewerage for additions and alterations at McKinley Beach Bath House	295.00
47	May 11, 1920	Walter J. Krauss	Lathing and plastering for additions and alterations at McKinley Beach Bath House	244.00
171	July 12, 1920	Standard Sheet Metal Works	New skylight on Greenbush Street Natatorium	2,750.00
173	July 16, 1920	Wilbur Lumber Company	Lumber and timber for reconstruction of roadway floor on 27th Street Viaduct	38,672.00
182	July 31, 1920	T. L. Smith Co	Grey iron castings for reconstruction of roadway floor on the 27th Street Viaduct	2,200.00
183	July 17, 1920	Dean Construction Co	Laying creosote wood block pavement for reconstruction of roadway floor of the 27th Street Viaduct	45,405.00

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
194	Aug. 9, 1920	Worden-Allen Company	Structural steel for the reconstruction of the roadway floor of the 27th Street Viaduct	19,595.00
206	Aug. 9, 1920	Wisconsin Ice & Coal Co	For use of strip of land 10 feet wide for passageway to foot bridge across Milwaukee River at North Ave	1.00
224	Aug. 31, 1920	Whitney Construction Co	Construction of temporary foot bridge across Milwaukee River at North Ave.	7,432.00
234	Aug. 30, 1920	American Laundry Machinery Co.	Sterilizing equipment for laundry and kitchen building on Mitchell Street, bet. 18th and 19th Ave	2,899.00
259	Oct. 5, 1920	Phillip C. Pfersch & Caroline Pfersch	Lease of premises at the southeast corner of Biddle and Market Street, known as 508 Market Street, per month	85.00
277	Nov. 4, 1920	Michie Construction Co	Mason, concrete, roofing, carpenter, steel, lath and plastering, galvanized iron and tin work for the construction of refrigerating room addition at the South View Hospital	2,040.00
278	Nov. 3, 1920	Wierdsma & Laatsch	Mason, concrete, carpenter, roofing, steel and galvanized iron and tin work necessary for the construction of ambulance entrance at South View Hospital	1,090.00
279	Nov. 3, 1920	Wierdsma & Laatsch	Carpenter work, roofing, lath and plastering, galvanized iron and tin work necessary for the construction of screen porches at the South View Hospital	4,500.00
280	Nov. 8, 1920	Paul Nagtegaal	Mason, cut stone, steel, carpenter, roofing and galvanized iron and tin work necessary for the construction of Entrance Shelters at the South View Hospital	5,850.00
284	Dec. 27, 1920	Great Lakes Dredge & Dock Co.	Furnishing and driving piles and repairing timber work at Sixth Street, Sixteenth Street and Muskego Ave. Bridges	14,873.00
97	June 2, 1920	W. T. Werner	Pipe sewer in Atkinson Ave., from 12th to 15th Streets	3,322.35
98	June 11, 1920	Michael Synovitz	Pipe sewer in Concordia Ave., from 20th Street, to a point 100 feet west of 20th Street	426.08
99	June 2, 1920	W. T. Werner	Storm and sanitary sewer in Fifth Street, from Keefe Ave. to Jefferson Street	6,991.53
100	June 2, 1920	W. T. Werner	Pipe sewer in 47th Street, from Meinecke Ave. to Wright St.	1,381.42
101	June 2, 1920	W. T. Werner	Pipe sewer in 48th Street, from Meinecke Ave. to Wright Street, and in Wright Street, from 48th Street to a point 130 feet west of 46th Street	4,716.30
102	June 2, 1920	W. T. Werner	Pipe, storm and sanitary sewer in 4th Street, from Keefe Ave. to Vienna Ave	4,478.58

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
103	June 2, 1920	W. T. Werner	Pipe, storm and sanitary sewer in Franklin Street, from 17th Street to a point 155 feet east of 17th Street	1,292.00
104	June 2, 1920	W. T. Werner	Pipe, storm and sanitary sewer in Nash Street, from 17th Street to West 19th Street	3,465.28
107	June 15, 1920	J. B. Forrestal Co	Pipe, storm and sanitary sewer in 17th Street, from Franklin Street to Lake Street	4,483.22
108	June 18, 1920	M. Synovitz	Pipe, storm and sanitary sewer on 16th Street, from Melvina Street to Lake Street	3,426.80
109	June 15, 1920	J. B. Forrestal & Co	Pipe, storm and sanitary sewer on 18th Street, from a point 125 feet south of Nash Street, to Lake Street	7,003.62
110	June 18, 1920	M. Synovitz	Pipe sewer in Fratney Street, from Keefe Ave. to Becker Ave.	2,546.25
175	July 16, 1920	J. B. Forrestal Co	Pipe, storm and sanitary sewer in Atkinson Ave., from 15th Street to West 19th Street	9,985.28
176	July 16, 1920	Herman Hohensee	Pipe sewer in Center Street, from 46th to 49th Street	7,676.50
177	July 19, 1920	Michael Synovitz	Pipe sewer in Center Street, from 49th Street to 50th Street	1,482.00
178	July 22, 1920	George E. Zimmermann	Pipe sewer in Elliott Circle from 58th to 59th Street	1,446.06
179	July 19, 1920	Michael Synovitz	Pipe sewer in Meinecke Ave., from 48th Street to a point 135 feet west of 48th Street	1,867.50
180	July 16, 1920	J. B. Forrestal Co	Pipe, storm and sanitary sewer in 7th Street, from Lake Street to Green Bay Ave	8,344.98
181	July 22, 1920	George E. Zimmermann	Pipe sewer in Windsor Ave., from Elliott Circle to 60th Street	536.09
196	Aug. 4, 1920	George E. Zimmermann	Sewer in Hinman Street and Hinman extended between 8th and 10th Street	14,383.00
216	Aug. 18, 1920	Herman Hohensee	Sewer in Clarke Street, from 46th Street to 47th Street	3,125.50
217	Aug. 27, 1920	Michael Synovitz	Sewer in 47th Street, from Center to Wright Streets	3,766.75
218	Aug. 27, 1920	Michael Synovitz	Sewer in 49th Street, from a point 400 feet south of Center Street to Center Street	1,532.16
219	Aug. 14, 1920	J. B. Forrestal Co	Sewer in Rhode Island Ave., from Superior Street to City Limits	1,706.64
220	Aug. 17, 1920	W. T. Werner	Sewer in Townsend Street, from 24th Street to West 24th Street	2,067.80
221	Aug. 27, 1920	Michael Synovitz	Sewer in Weil Street, from Concordia Ave. to first alley north of Auer Ave.	2,059.20
222	Aug. 27, 1920	Michael Synovitz	Sewer in Windlake Ave., from 13th Ave. to Harrison Ave. extended	1,640.00
223	Aug. 17, 1920	W. T. Werner	Sewer in Wright Street, from 48th Street to 49th Street	1,930.00

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
236	Sept. 8, 1920	Herman Hohensee	Pipe, storm and sanitary sewer in Lake Street, from West 19th to 24th Street	24,281.79
238	Sept. 8, 1920	Herman Hohensee	Pipe, storm and sanitary sewer in 20th Street, from Teutonia to Lake Street	8,555.58
239	Sept. 4, 1920	J. B. Forrestal Co	Pipe, storm and sanitary sewer in Pease Street, from 20th to 21st Street	1,139.00
240	Sept. 8, 1920	George E. Zimmermann	Pipe, storm and sanitary sewer in 21st Street, from Franklin Street to a point 240 feet south of Pease Street	8,547.33
241	Sept. 4, 1920	J. B. Forrestal Co	Pipe, storm and sanitary sewer in 22nd Street, from Herbert Street to Lake Street, and in Pease Street, from 21st to 22nd Streets	22,323.20
242	Sept. 4, 1920	J. B. Forrestal Co	Pipe, storm and sanitary sewer, in 24th Street, from Franklin to Pease Street, and in Franklin Street from 24th to West 24th; and West 24th from Franklin to a point 120 feet north of Franklin	5,128.20
243	Sept. 3, 1920	W. T. Werner	Pipe, storm and sanitary sewer in 24th Street, from Franklin Street to Lake Street; and in 23rd Street from Pease to Lake Street; Franklin Street, from 22nd to 24th Street; and in Melvina Street, from 22nd Street to 24th Street	48,442.18
244	Sept. 14, 1920	Michael Synovitz	Pipe, storm and sanitary sewer in Melvina Street, from West 19th Street to 20th Street	2,404.35
11	Mar. 19, 1920	Great Lakes Dredge & Dock Co.	Dredging the several rivers and canals of the City of Milwaukee	30,000.00
96	May 28, 1920	Great Lakes Dredge & Dock Co.	Constructing Bulkhead—east of Jones Island and south of Sewerage Commission's tract—at Milwaukee Harbor	215,863.00
41	Apr. 16, 1920	W. F. Cummings, Inc	Installing street lighting material	320,000.00
1	Jan. 5, 1920	Random Lake Ice Co	Right to cut ice on site for Pumping Station	100.00
2	Feb. 1, 1920	Best Block Co	Lease of Pumping Station site	250.00
15	Apr. 1, 1920	Whitney Const. Co	Replace with reinforced concrete construction, wood covering of the Intake Chamber, Milwaukee River Flushing Works	5,660.00
22	Apr. 2, 1920	Ryan & Ryan	Hauling and delivering water pipe, hydrants and special castings during the year 1920	2,900.00
48	Apr. 26, 1920	Cohen Iron & Metal Co	To purchase from Water Department, scrap iron, brass borings and mixed brass	1,781.83
49	May 11, 1920	Edward O'Donnell	Laying 6-inch, 88-inch, 12-inch and 16-inch water pipe during the year 1920	42,900.00

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
			Concession at Kilbourn Park	125.00
106	May 26, 1920	A. M. Johnson	Mason work, Water Works Meter Shop	10,980.00
151	July 15, 1920	J. M. Steigerwald	Concrete and cement work, Water Works Meter Shop	20,936.00
152	July 7, 1920	Paul Bringe	Lathing and plastering, Water Works Meter Shop	294.00
153	July 12, 1920	F. W. Baumann	Cut stone work, Water Works Meter Shop	1,056.00
154	July 13, 1920	C. W. Tingley	Cast and wrought iron work, Water Works Meter Shop	4,928.00
155	July 9, 1920	C. Hennecke Company	Carpenter work, Water Works Meter Shop	1,685.00
156	July 6, 1920	C. A. Kleppe	Galvanized iron and tin work, Water Works Meter Shop	3,800.00
157	July 8, 1920	Adolph Schumann	Plumbing, sewerage and gas fitting, Water Works Meter Shop	4,578.00
158	July 9, 1920	O. P. Zimmermann	Roofing, Water Works Meter Shop	650.00
159	July 8, 1920	Cream City Roof'g & Pt. Mfg. Co.	Heating and ventilating, Water Works Meter Shop	3,807.00
160	July 14, 1920	W. A. Bowers Heating Co	Hardware, Water Works Meter Shop	133.00
161	July 19, 1920	H. F. Haessler Hardware Co	Scale, Water Works Meter Shop	485.00
162	July 6, 1920	Milwaukee Scale & Supply Co	Elevator, Water Works Meter Shop	4,330.00
163	July 7, 1920	S. Heller Elevator Co	River Wall at Riverside Pumping Station	31,487.82
233	Aug. 24, 1920	Herman Hohensee	Mason and concrete work for alterations, North Boiler Room, North Point Pumping Station	995.00
281	Nov. 27, 1920	Anton Schmitt	Carpenter work for alteration, North Boiler Room, North Point Pumping Station	674.00
282	Nov. 24, 1920	Chas. Guetzkow	Construct, furnish and deliver F. O. B. cars Milwaukee, two Circular Sluice Gates, each 9 feet in diameter, clear opening complete with all appurtenances	10,080.00
283	Dec. 18, 1920	Chapman Valve Mfg. Co	Removing old and furnishing one new marine tube type boiler on fireboat No. 29	16,750.00
3	Mar. 2, 1920	De Pere-Burton Co	Laying house drains and water connections in Windsor Ave., from Spring Ave. to Elliott Circle, in the 22nd Ward	276.00
21	Apr. 22, 1920	George E. Zimmermann	House drains and water connections in 32nd Ave., from Greenfield Ave. to Orchard Place	252.00
27	May 5, 1920	George E. Zimmermann	House drains and water connections in Herbert Street, from 22nd to West 24th Street, 20th Ward	930.70
35	May 5, 1920	George E. Zimmermann	House drain and water connections on 9th Ave., from Dakota Street to a point 588 feet north, 14th Ward	1,234.00
36	Apr. 20, 1920	W. T. Werner	House drains and water connections in 58th Street, from Elliott Circle to North Ave., 22nd Ward	699.50
37	Apr. 22, 1920	George E. Zimmermann		

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
38	Apr. 22, 1920	George E. Zimmermann	House drains and water connections, in 58th Street, from Pabst Ave. to Elliott Circle, 22nd Ward	1,119.60
39	Apr. 22, 1920	George E. Zimmermann	House drains and water connections, in 59th Street, from Elliott Circle to North Ave., 22nd Ward	564.00
40	Apr. 22, 1920	George E. Zimmermann	House drains and water connections, in 59th Street, from Pabst Ave. to Elliott Circle, 22nd Ward	915.00
105	June 11, 1920	George E. Zimmermann	House drains and water connections, in South Pierce Street, from 15th to 22nd Aves., 23rd Ward	862.40
111	June 18, 1920	W. T. Werner	House drains and water connections, in South Pierce Street, from Hanover to 7th Ave	1,271.60
112	July 2, 1920	Kehrein Construction Co	House drains and water connections in Maryland Ave. from Newport Ave. to Edgewood Ave., 18th Ward	1,953.00
113	June 24, 1920	George E. Zimmermann	House drains and water connections in Elliott Circle, in the 22nd Ward	1,746.00
114	June 23, 1920	F. A. Goll	House drains and water connections, South Pierce and Shea Ave., from Layton Blvd., to 27th Ave., 23rd Ward	2,494.80
115	June 23, 1920	F. A. Goll	House drains and water connections in 11th Street, from Atkinson Ave. to Lake Street, 20th Ward	6,580.00
116	June 18, 1920	W. T. Werner	House drains and water connections in Melvina Street, from 19th Street to Teutonia Ave., 25th Ward	3,041.00
117	June 24, 1920	George E. Zimmermann	House drains and water connections, in 10th Street, from Graham Street to Lake Street, 25th Ward	7,385.30
118	June 23, 1920	F. A. Goll	House drains and water connections in 12th Street, from Lake Street to Atkinson Ave., 25th Ward	6,108.90
119	June 18, 1920	W. T. Werner	House drains and water connections, in West 19th Street, from Franklin to Atkinson Ave	3,198.00
164	July 8, 1920	Kehrein Construction Co	House drains and water connections, Franklin Street, from 16th to Teutonia Ave, 25th Ward	1,177.00
165	July 13, 1920	W. T. Werner	House drains and water connections, in Nash Street, from 17th to Teutonia Ave., 25th Ward	2,888.75
166	July 12, 1920	George E. Zimmermann	House drains and water connections, in 2nd Street, from Keefe Ave. to Vienna Ave., 21st Ward	5,164.30
167	July 13, 1920	F. A. Goll	House drains and water connections, in 20th Street, from Teutonia Ave. to Lake Street, 25th Ward	4,518.30

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
168	July 13, 1920	F. A. Goll	House drains and water connections, in 21st Street, from Teutonia Ave. to North Line of Rosemont, 25th Ward	333.90
169	July 8, 1920	Kehrein Construction Co	House drains and water connections, in 21st Street, from Pease Street to a point 11.14 feet north of Lot 86, Blk. 2, Rosemont	7,039.00
172	July 12, 1920	Jos. B. Forrestal Co	Laying water pipe, gates and hydrants and constructing manholes in Stewart Street, from Kinnickinnic Ave. and a point 557 feet easterly of Allis Street, also in Becher Street, at Robinson Ave., for Fire Department	3,989.90
184	July 31, 1920	Kehrein Construction Co	House drains and water connections in Chambers Street, from 39th to 41st Streets, in the 20th Ward	336.00
185	July 31, 1920	Kehrein Construction Co	House drains and water connections, in 15th Street, from Nash Street to Atkinson Ave., 25th Ward	1,920.80
186	July 31, 1920	Kehrein Construction Co	House drains and water connections, in Franklin Street, from 20th to 22nd Streets, 20th Ward	120.00
187	July 31, 1920	Kehrein Construction Co	House drains and water connections in Sherman Blvd., from Center Street to Burleigh, 20th Ward	5,644.50
188	July 28, 1920	W. T. Werner	House drains and water connections, in 47th St., from Meinecke Ave. to Center Street, 22nd Ward	6,897.50
189	July 28, 1920	W. T. Werner	House drains and water connections, in 16th Street, from Nash to Atkinson Ave., 25th Ward	2,885.80
190	July 29, 1920	F. A. Goll	House drains and water connections, in Richards Street, from Franklin Street to Lake Street, 21st Ward	4,888.90
191	July 26, 1920	George E. Zimmermann	House drains and water connection in Cawker Place, from 30th Street to right-of-way of C. M. & St. P. Ry., 20th Ward	158.00
192	July 26, 1920	George E. Zimmermann	House drains and water connections in 53rd Street, from Vine Street to the north line of Enterprising Land Company	324.00
193	July 26, 1920	George E. Zimmermann	House drains and water connections, in 17th Street, from Nash Street to Atkinson Ave., 25th Ward	3,946.00
195	Aug. 2, 1920	George E. Zimmermann	House drains and water connection in Marshall Street, from Michigan to Wisconsin Streets, 3rd Ward	518.50
237	Sept. 23, 1920	Kehrein Construction Co	House drains and water connections in American Ave., from Cleveland Ave. to north line of Lot 7, Blk. 4, Pulaski Park, 14th Ward	1,892.00
245	Sept. 18, 1920	George E. Zimmermann	House drains and water connections in Center Street, from Sherman Blvd. to 51st Street, 20th and 22nd Wards	5,759.60

LIST OF CONTRACTS AWARDED DURING 1920—Continued

Cont. No.	DATE	NAME OF CONTRACTOR	WORK OR MATERIAL	AMOUNT
246	Sept. 17, 1920.....	W. T. Werner.....	House drains and water connections in 14th Street, from Atkinson Ave. to Lake Street, 25th Ward.....	3,346.00
247	Sept. 18, 1920.....	George E. Zimmermann.....	House drains and water connections in 15th Street, from Atkinson Ave. to Lake Street, 25th Ward.....	721.80
248	Sept. 17, 1920.....	W. T. Werner.....	House drains and water connections in Louis Ave., from Atkinson Ave. to Lake Street, 25th Ward.....	6,733.80

January 1, 1921

List of Permanent Pavements Upon Which the Guarantee Period Commences in 1920

PERMANENT PAVEMENTS UNDER GUARANTEE

An additional list of streets and alleys having permanent pavements, the guarantee period of same commencing during the year 1920, as follows:

CONTRACTOR	STREET FROM TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Blodgett-Clayton Const. Co.	Alley, Blk. 9, Grand View, bet. 27th and 28th Streets, Burleigh and Auer Ave., 20th Ward	3	Cement Conc.	Dec. 11, 1923
Frank Banaszak	Alley, Blk. 3, Johnson Park, bet. Scott and Frederica Place, 32nd and Trowbridge Aves., 23rd Ward	3	Cement Conc.	Dec. 11, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 94, Blk. 7, Vliet's Add. and Blk. 1, L. Hinmantls' Subd., bet. 12th and 13th Streets, Walnut, Fond du Lac Ave., and Sherman Street, 10th Ward	3	Cement Conc.	June 7, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 8, Eimmermann's Sub., Blk. 8, Assessmt. Sub. No. 36, and Vliet's Addition, bet. Fond du Lac, Vine, 13th and 14th Streets, 10th Ward	3	Cement Conc.	June 2, 1923
Otto Bodemann	Alley, Blk. 6, Warner Bros. & Wamboldt's Sub., and Blk. 3, Forest Park, bet. 29th and 30th Streets, Auer Ave. and Burleigh Street, 20th Ward	3	Cement Conc	June 1, 1923
Otto Bodemann	Alley, bet. 55th and 56th Streets, North Ave. and Elm Street, 22nd Ward	3	Cement Conc.	June 8, 1923
Otto Bodemann	Alley, bet. 56th and 57th Streets, North Ave. and Elm Street, in the 22nd Ward	3	Cement Conc.	June 8, 1923
Michael Switalski	Alley, Blk. 10, Cont. of Grand View, bet. 27th and 28th Streets, Concordia and Auer Aves., 20th Ward	3	Cement Conc.	June 24, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 8, Miner's Addition, bet. 20th and 21st Streets, Vliet and Cherry Streets, 9th Ward	3	Cement Conc.	June 24, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 228, Cont. of Brown's Add., bet. 20th and 21st Streets, Elm and Fond du Lac Ave., 10th Ward	3	Cement Conc.	June 24, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 3, May's Sub., bet. Walnut and Vine Streets, 23rd and 24th Streets, 9th Ward	3	Cement Conc.	June 18, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 7, Meehan's & Somer's Subd., bet. 24th and West 24th Streets, Lloyd and Elm Streets, 10th Ward	3	Cement Conc.	June 24, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 7, Germania Heights, bet. Lisbon Ave. and Vine Street, 25th and 26th Streets, 19th Ward	3	Cement Conc.	June 17, 1923

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Frank Banaszak	Alley, Blk. 12, Milwaukee Proper, bet. Washington and Scott Streets, Hanover and Reed Streets, 5th Ward			3	Cement Conc...	June 21, 1923
Otto Bodemann	Alley, Blk. 3, Parkside, bet. 39th and 40th Streets, Cherry and Galena Streets, 19th Ward			3	Cement Conc ..	June 25, 1923
Retzlaff, Froemming & Bluhm.	Alleys, Blk. 1, Littlejohn Heights, Louis Ave. Heights, Blk. 1, Douglas Sub., bet. Louis Ave. and 14th Street, Burleigh and Ring Streets, 25th Ward			3	Cement Conc...	July 3, 1923
Otto Bodemann	Alley, Blk .1, Enterprise Land Co.'s Sub. No. 1, Blk. 1, Cont. of Hi Mount, etc., bet. 52nd and 53rd Streets, Vine and Pabst Ave., 19th Ward			3	Cement Conc...	July 7, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Sarnow's Subd., Blk. 1, Parkside, bet. 38th and 40th Streets, Walnut and Roberts Streets, 19th Ward			3	Cement Conc...	July 3, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Grand View Park, bet. 37th and 38th Streets, Pabst Ave. and Brown Street, 19th Ward			3	Cement Conc...	July 3, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 4, Cont. of Concordia Heights, Blk. 4, Grand View, bet. 26th and 27th Streets, Auer and Concordia Aves., 20th Ward			3	Cement Conc...	July 6, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 1, Fuller-Warren Heights, bet. 33rd and 34th Streets, Center and Hadley Streets, 20th Ward			3	Cement Conc...	July 8, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Lisbon Ave. Park, bet. Lisbon and Pabst Aves. and 41st Street, in the 19th Ward			3	Cement Conc...	July 7, 1923
Frank Banaszak	Alley, Blk. 4, Arlington Heights, bet. 32nd and 33rd Aves., National Ave. and South Pierce Street, 23rd Ward			3	Cement Conc...	July 9, 1923
Otto Bodemann	Alley, Blk. 4, Residence Park, bet. 37th and 38th Streets, Hadley and Locust Streets, 20th Ward			3	Cement Conc ..	July 14, 1923
Michael Switalski	Alley, Blk. 6, Cawker's Subd. "A", bet. 27th and 28th Streets, Chambbers and Locust Streets, 20th Ward			3	Cement Conc...	July 14, 1923
Froemming Brothers	Alley, Blk. 9, bet. 4th and 5th Streets, Galena and Walnut Streets, 6th Ward			3	Cement Conc...	July 13, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 8, Grand View, bet. 24th and West 24th, Burleigh and Auer Ave., 20th Ward			3	Cement Conc...	July 14, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 38, J. L. Pierce's Sub., bet. Booth and Holton Streets, North Ave. and Lee Streets, 13th Ward			3	Cement Conc...	July 14, 1923
Otto Bodemann	Alley, Blk. 33, Residence Park No. 2, bet. 38th and 39th Streets, Hadley and Locust Streets, 20th Ward			3	Cement Conc...	July 26, 1923

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Otto Bodemann	Alley, Blk. 31, Residence Park No. 2, bet. 38th and 39th Streets,	Locust and Chambers Streets,	20th Ward	3	Cement Conc.	July 26, 1923
Frank Banaszak	Alley, Blk. 152, bet. East Water and Market Streets, Knapp Street	and Juneau Ave.,	3rd Ward	3	Cement Conc.	July 28, 1923
Frank Banaszak	Alley, Blk. 3 and 12, Sub. of Blk. 3, in Clarke's Addition and that part of fractional Blk. 12, etc., bet. 17th and 18th Aves, South	Pierce Street and National Ave.,	23rd Ward	3	Cement Conc.	July 29, 1923
Milwaukee Gen'l Const. Co.	Alley, Blk. 6, Traveler's Heights, bet. 55th and 56th Streets, Pabst	Ave. and Elm Street,	22nd Ward	3	Cement Conc.	July 14, 1923
Michael Switalski	Alley, Blk. 4, Irving Park, etc., bet. 14th and 15th Streets, Davis	Street and Finn Place,	25th Ward	3	Cement Conc.	July 29, 1923
Retzlaff, Froemming & Bluhm	Alley, Blk. 1, Cawker's Sub. "A", bet. 27th and 28th Streets, Bur-	leigh and Chambers Streets,	20th Ward	3	Cement Conc.	July 27, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 25, Sub. of West ½ of Blk. 1, bet. 10th and 11th Streets,	Vine and Harmon Streets,	10th Ward	3	Cement Conc.	July 27, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 5, Vliet's Add., bet. Sherman and Walnut, 10th and 11th	Streets,	10th Ward	3	Cement Conc.	July 27, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 2, Cawker's Subd. "A", bet. 28th and 29th Streets, Bur-	leigh and Chambers Streets,	20th Ward	3	Cement Conc.	July 27, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 5, Cawker's Subd. "A", bet. 28th and 29th Streets, Locust	and Chambers Streets,	20th Ward	3	Cement Conc.	July 27, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 5, Fond du Lac Ave. Addition, bet. 29th and 30th Streets,	Locust and Chambers Streets,	20th Ward	3	Cement Conc.	Aug. 6, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 8, Cawker's Subd. "A", bet. 28th and 29th Streets, Hadley	and Locust Streets,	20th Ward	3	Cement Conc.	Aug. 6, 1923
Retzlaff, Froemming & Bluhm.	Alley, Blk. 7, Cawker's Subd. "A", bet. 27th and 28th Streets, Hadley	and Locust Streets,	20th Ward	3	Cement Conc.	Aug. 3, 1923
Bodemann Const. Co.	Alley, Blk. 10, Milwaukee Savings & Investment Asso. No. 2, bet.	10th and 11th Streets, Ring and Concordia Ave.,	25th Ward	3	Cement Conc.	Aug. 12, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 277, Hawley's Subd. No. 2, bet. 26th and 27th Streets,	State and Cedar Streets,	15th Ward	3	Cement Conc.	Aug. 10, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 12, Pierce and Davis Add. No. 3, bet. 8th and 9th Streets,	Ring and Concordia Ave.,	25th Ward	3	Cement Conc.	July 29, 1923

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET FROM TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Blodgett-Clayton Const. Co.	Alley, Blk. 6, etc., bet. 11th and 12th Streets, Concordia Ave. and Davis Street, 25th Ward	3	Cement Conc.	July 27, 1923
Blodgett-Clayton Const. Co.	Alley, Barber & Platto's Subd., etc., bet. Fratney and North Pierce Streets, Wright and Clarke Streets, 13th Ward	3	Cement Conc.	July 29, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 13, Pierce & Davis Addition No. 3, etc., bet. 8th and 9th Streets, Concordia Ave. and Davis Streets, 25th Ward	3	Cement Conc.	July 29, 1923
Otto Bodemann	Alley, Blk. 24, Residence Park, bet. Grant and Sherman Blvds., Hadley and Locust Streets, 20th Ward	3	Cement Conc.	Aug. 3, 1923
Blodgett-Clayton Const. Co.	Alley Blk. 6, Sherman Park, bet. 38th and 39th Streets, Center and Clarke Streets, 22nd Ward	3	Cement Conc.	Aug. 7, 1923
Bodemann Const. Co.	Alley, Blk. 16, 3rd Cont. of Blvd. Park, bet. 39th and 40th Streets, Clarke and Center Streets, 22nd Ward	3	Cement Conc.	Aug. 12, 1923
Milwaukee Gen'l Const. Co.	Alley, Blk. 1, M. Keenan's Subd., Blk. 1, Sub. of Lots 3, 4, 5, 6, 7, 8, 9, etc., bet. Walker, National Ave., 10th and 11th Aves. 23rd Ward.	3	Cement Conc.	July 29, 1923
Milwaukee Gen'l Const. Co.	Alley, Blk. 1?3, Sub. of So. 23.572 acres, etc., bet. 12th and 13th Streets, Wells and Cedar Streets, 4th Ward	3	Cement Conc.	July 29, 1923
Ryback & Sadowski	Alley, Blk. 2, C. Bushardt's Subd., Blk 2, Kretschmar Sub., bet. 25th and 26th Aves., Orchard and Lapham Streets, 11th Ward	3	Cement Conc.	Aug. 12, 1923
Ryback & Sadowski	Alley, Blk. 10, Mark S. Tyson's Sub. No. 2, and Blk. 2, Washington Ave. Sub. bet. 20th and 21st Aves., Lapham and Mitchell Streets, 11th Ward	3	Cement Conc.	Aug. 12, 1923
M. Switalski	Alley, Blk. 13, Cont. of Merrill Park, bet. 32nd and 33rd Streets, Park Hill and Mt. Vernon Aves., 16th Ward	3	Cement Conc.	Aug. 18, 1923
Bodemann Const. Co.	Alley, Blk. 9, Milwaukee Saving's & Invest. Asso. Sub. No. 2, bet. 9th and 10th Streets, Ring and Concordia Ave., 25th Ward	3	Cement Conc.	Aug. 18, 1923
Bodemann Const. Co.	Alley, Blk. 1, Opportunity Add. and lands, etc., bet. Davis and Finn P'ace, 17th and 18th Streets, 25th Ward	3	Cement Conc.	Aug. 16, 1923
Blodgett-Clayton Const. Co.	Alley, Blk. 3, Tweedy's Sub., bet. 26th and 28th Aves., Madison and Greenfield Aves., 23rd Ward	3	Cement Conc.	Aug. 13, 1923
Bodemann Const. Co.	Alley, Blk. 1, U. S. Invest. Asso. Sub. No. 2, bet. 14th and 15th Streets, Concordia Ave. and Ring Street, 25th Ward	3	Cement Conc.	Aug. 26, 1923
Bodemann Const. Co.	Alley, Blk. 12, Milwaukee Savings & Investment Asso. Sub. No. 2, bet. 12th and Louis Ave., Concordia and Ring Street, 25th Ward	3	Cement Conc.	Aug. 26, 1923

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Frank Banaszak	Alley, Blk. 5, Hopkins and Hadley's Sub. No. 2, bet. Arthur and Harrison Aves., 10th and American Aves., 14th Ward			3	Cement Conc...	Aug. 25, 1923
Dean Const. Co	Alley, Blk. 11, Resurvey of Blk. 12, 11 and West ½ of 10, Mallory and Kern's Sub., bet. 33rd and 34th Streets, Lisbon Ave. and Vine Streets, 19th Ward			3	Cement Conc...	Aug. 23, 1923
Retzlaff, Froemming & Bluhm	Alley, Blk. 6, Grand View, bet. 25th and 26th Streets, Burleigh and Auer Ave., 20th Ward			3	Cement Conc...	Sept. 4, 1923
Frank Banaszak	Alley, Blk. 2, Desmond Sub. bet. 5th and 6th Aves., Hayes and Arthur Aves., 1t4h Ward			3	Cement Conc...	Aug. 27, 1923
Ryback & Sadowski	Alley, Blk. 1, Hopkins Park No. 1, bet. 26th and 27th Aves., Mitchell and Lapham Streets, 11th Ward			3	Cement Conc...	Aug. 23, 1923
Michael Switalski	Alley, Blk. 12, Cont. of Merrill Park, bet. 34th and 35th Streets, Clybourn and St. Paul Ave., 16th Ward			3	Cement Conc ..	Sept. 10, 1923
Kehrein Construction Co	Alley, Blk. 1, Florence Park, Blk. 1, W. P. McLaren Subd. No. 1, bet. Fratney and North Pierce Streets, Brattle Street and Keefe Ave., 21st Ward			3	Cement Conc...	Sept. 9, 1923
Retzlaff, Froemming & Bluhm	Alley, Blk. 11, L. Wechselberg's Sub. No. 1, and Lands, etc., bet. West 24th and 25th Streets, Hadley and Locust Sts., 20th Ward			3	Cement Conc...	Sept. 14, 1923
Rayback & Sadowski	Alley, Blk. 4, Merrill's Sub., etc., bet. Layton Blvd., and 21st Ave., Grant and Becher Streets, 24th Ward			3	Cement Conc...	Sept. 16, 1923
Retzlaff, Froemming & Bluhm	Alley, Blk. 101, bet. 6th and 7th Streets, Galena and Walnut Streets, 6th Ward			3	Cement Conc...	Sept. 21, 1923
Retzlaff, Froemming & Bluhm	Alley, Blk. 1, Schneider Park, bet. 35th and 37th Streets, Vliet and Cherry Streets, 19th Ward			3	Cement Conc...	Sept. 21, 1923
Retzlaff, Froemming & Bluhm	Alley, Blk. 3, Cawker's Sub. "A", etc., bet. 29th and 30th Streets, Chambers and Burleigh Streets, 20th Ward			3	Cement Conc...	Sept. 21, 1923
Bodemann Const. Co	Alley, Blk. 2, Keystone, bet. 47th and 48th Streets, North and Meinecke Aves., 22nd Ward			3	Cement Conc...	Sept. 24, 1923
Bodemann Const. Co	Alley, Blk. 1, Public Park Land Asso. Sub., bet. 47th and 48th Streets, Elm Street and North Ave., 22nd Ward			3	Cement Conc ..	Sept. 29, 1923
Ryback & Sadowski	Alley, Blk. 7, Hopkins Park, bet. 26th and 27th Aves., Grant and Becher Streets, 24th Ward			3	Cement Conc...	Sept. 17, 1923
Froemming Brothers	Alley, Blk. "N", B. Haskins Sub., bet. 5th and 6th Streets, Walnut and Sherman Streets, 6th Ward			3	Cement Conc...	Sept. 28, 1923

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET FROM TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Froemming Brothers	Alley, Blk. 36, Sherman's Add., bet. 1st and 2nd Streets, Sherman Street and Reservoir Ave., 6th Ward	3	Cement Conc...	Sept. 28, 1923
Bodemann Const. Co	Alley, Blk. 12, A. K. Mayhew's Sub., etc., bet. 20th and 21st Streets, Locust and Chambers Streets, 20th Ward	3	Cement Conc...	Sept. 30, 1923
A. J. Koehn & Co	Alley, Blk. 8, Walnut Hill, bet. 32nd and 33rd Streets, Walnut and Galena Streets, 19th Ward	3	Cement Conc...	Sept. 28, 1923
Froemming Brothers	Alley, Blk. 26, bet. 5th and 6th Streets, Cherry and Galena Streets, in the 6th Ward	3	Cement Conc...	Oct. 1, 1923
R. H. Gumz	Alley, Blk. 3, Saving's & Investment Association of Milwaukee No. 6, bet. Arthur and Harrison Aves., 3rd and 4th Aves., 14th Ward	3	Cement Conc...	Sept. 28, 1923
Kehrein Construction Co	Alley, Blk. 207, Sub. of South 23.572 acres of east 38 acres, bet. 13th and 14th Streets, Cedar and State Streets, 2nd Ward	3	Cement Conc...	Oct. 2, 1923
Bodemann Const. Co	Alley, Blk. 4, Cawker Sub. "B", etc., bet. 24th and West 24th Streets, Locust and Chambers Streets, 20th Ward	3	Cement Conc...	Oct. 15, 1923
M. Switalski	Alley, Blk. 256, Rogers Sub., etc., bet. 16th and 17th Streets, Clybourn and Grand Ave., 4th Ward	3	Cement Conc...	Oct. 16, 1923
Retzlaff, Froemming & Bluhm	Alley, Blk. 1, Mariner's Sub., bet. Stanley Street and Humboldt Ave., Walworth and Lee Streets, 13th Ward	3	Cement Conc...	Oct. 15, 1923
Otto Bodemann	Alley, Blk. 4, Traveler's Heights, Blk. 7, Elliott Circle, bet. 57th and 58th Streets, Elm and Pabst Ave., 22nd Ward	3	Cement Conc...	Oct. 27, 1923
Dean Const. Co	Alley, Blk. 8, Cont. of Merrill Park, bet. 30th and 31st Streets, St. Paul Ave., and Clybourn Streets, 16th Ward	3	Cement Conc...	Oct. 15, 1923
Blodgett-Clayton Const. Co	Alley, Blk. 14, Milwaukee Savings & Invest. Assoc. Sub. No. 2, bet. 11th and 12th Streets, Burleigh and Ring Streets, 25th Ward	3	Cement Conc...	Sept. 28, 1923
Diamond "C" Const. Co	Alley, Blk. 26, Sub. of West ½ of Blk. 1, and Blks. 25 and 26, Vliet's Add., bet. 10th and 11th Streets, Harmon and Lloyd Sts., 10th Ward	3	Cement Conc...	Nov. 5, 1923
Ryback & Sadowski	Alley, Blk. 3, Perrigo Park, bet. 40th and 41st Streets, Locust and Chambers Streets, 20th Ward	3	Cement Conc...	Nov. 10, 1923
Froemming Brothers	Alley, Blk. 218, Williams Add., bet. 8th and 9th Streets, Garfield and North Aves., 6th Ward	3	Cement Conc...	Nov. 5, 1923
Froemming Brothers	Alley, Blk. 214, Williams Add., bet. 8th and 9th Streets, Harmon and Lloyd Streets, 6th Ward	3	Cement Conc...	Nov. 4, 1923
Frank Banaszak	Blk. 21, Walker's Point, bet. Grove and Greenbush Streets, Florida and Virginia Streets, 5th Ward	3	Cement Conc...	Nov. 4, 1923

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Kehrein Construction Co	Alley, Blk. 220, Brown's Add., bet. 19th and 20th Streets, Lloyd and Elm Streets and Fond du Lac Ave., 10th Ward			3	Cement Conc...	Nov. 10, 1923
Bodemann Const. Co	Alley, Blk. 2, Littlejohn Heights, bet. Burleigh and Ring Streets, 14th and 15th Streets, 25th Ward			3	Cement Conc...	Nov. 10, 1923
Bodemann Const. Co	Alley, Blk. 13, Walnut Hill, bet. 32nd and 33rd Streets, Galena and Cherry Streets, 19th Ward			3	Cement Conc...	Nov. 10, 1923
Bodemann Const. Co	Alley, Blk. 6, Irving Park, bet. 14th and 15th Streets, Nash Street and Atkinson Ave., 25th Ward			3	Cement Conc...	Nov. 10, 1923
White Const. Co	American Ave.	Dakota	Manitoba	5	Asphalt	Aug. 12, 1925
Badger Const. Co	Cherry	54th	Hawley Road	5	Asphalt	June 17, 1925
White Const. Co. (Assignee of F. P. Caughlin Co.)	Concordia Ave.	20th	21st	5	Asphalt	Aug. 16, 1925
M. Switalski	Cawker Place	30th	E. L. R. of W. of C. M. & St. P. Ry.	3	Cem. Sidewalks	Oct. 7, 1923
White Const. Co	58th Street	Pabst Ave.	Elliott Circle	5	Asphalt	Nov. 9 1925
White Const. Co	59th Street	Pabst Ave.	Elliott Circle	5	Asphalt	Nov. 9, 1925
White Const. Co	59th Street	North Ave.	Elliott Circle	5	Asphalt	Nov. 10, 1925
White Const. Co. (Assignee of F. P. Caughlin Co.)	Intersection of Van Buren and Mason Streets			5	Asphalt	Nov. 10, 1925
Badger Const. Co	Locust	33rd	35th	5	Asphalt	June 17, 1925
White Const. Co. (Assignee of F. P. Caughlin Co.)	Meinecke Ave.	39th	Sherman Blvd	5	Asphalt	Aug. 5, 1925
White Const. Co	Marshall	Michigan	Wisconsin	5	Asphalt	Nov. 24 1925
White Const. Co	Mitchell	Kinnickinnic Ave.	7th Ave.	5	Asphalt	Nov. 10, 1925
White Const. Co	9th Ave.	Dakota	A point 558 feet N. of Dakota St.	5	Asphalt	Aug. 16, 1925
White Const. Co	Ontario	Superior	Beulah Ave.	5	Asphalt	Nov. 24, 1925
White Const. Co	Richards	Franklin	S. L. of Lake St.	5	Asphalt	Nov .23, 1925
White Const. Co	17th Street	S. L. Mendel's Sub.	Davis	5	Asphalt	Oct. 14, 1925
White Const. Co	So. Pierce & Shea Av.	E. L. 15th Ave.	E. C. L. of 27th Ave.	5	Asphalt	Sept. 16, 1925
White Const. Co. (Assignee of F. P. Caughlin Co.)	Townsend	20th	24th	5	Asphalt	Aug. 5, 1925
White Const. Co. (Assignee of F. P. Caughlin Co.)	20th	Keefe Ave.	Franklin	5	Asphalt	Aug. 16, 1925

PERMANENT PAVEMENTS UNDER GUARANTEE—Continued.

CONTRACTOR	STREET	FROM	TO	Guarantee Lmt. Years	Kind Material	Expiration Guarantee
Froemming Brothers	Wright	Bolton	Dousman	3	Cem. Sidewalks	May 18, 1923
Retzlaff, Froemming & Bluhm.	Wright	Bolton	Dousman	3	Cement Conc ..	June 7 1923
White Const. Co. (Assignee of F. P. Caughlin Co.)	Wright	39th	Sherman Blvd.	5	Asphalt	Aug. 5, 1925
White Const. Co. (Assignee of F. P. Caughlin Co.)	Wells	24th	26th	5	Asphalt	Aug. 27, 1925
White Const. Co.	Wells	33rd	35th	5	Asphalt..	Sept. 14, 1925
White Const. Co.	Wisconsin	Marshall	R. of W. Railway Co.	5	Asphalt	Nov. 24, 1925
White Const. Co.	Windsor Ave.	Spring Av. (60th St.)	Elliott Circle	5	Asphalt	Nov. 10, 1925

PERMITS ISSUED DURING THE YEAR ENDING DECEMBER 31, 1920

1920	Excavations in Streets and Alleys		Deposit Building Material		House Drains		Storm Drains		Number of Extensions	Number of House Moving	Number of Miscellaneous
	No.	Amount	No.	Amount	No.	Amount	No.	Amount			
January	41	$ 41.00	57	$ 199.00	2	$ 3.00	.....	.....	47	.....	71
February	92	104.00	62	193.00	11	533.00	.....	.....	93	.....	89
March	138	145.00	149	344.00	40	220.00	3	13.00	211	4	166
April	204	289.00	268	409.00	121	467.00	2	8.00	235	6	261
May	190	250.00	332	506.00	97	240.00	11	35.00	202	5	286
June	185	387.00	340	515.00	198	668.00	38	114.00	212	6	309
July	196	488.00	277	411.00	350	554.00	206	393.00	200	6	248
August	227	345.00	208	329.00	156	468.00	40	120.00	241	4	275
September	140	259.00	211	328.00	111	323.00	43	126.00	223	8	229
October	208	316.00	145	249.00	149	423.00	88	204.00	189	2	224
November	178	301.00	64	160.00	156	546.00	88	149.00	142	3	182
December	150	205.00	43	119.00	75	211.00	32	96.00	100	.....	145
Totals	1949	$3,130.00	2156	$3,762.00	1466	$4,656.00	551	$1,258.00	2095	44	2462

Paid Permits issued	6,122
Free Permits issued	4,601
Total	10,723

Received for Excavating Permits	$ 3,130.00
Received for Deposit Bldg. Material Permits	3,762.00
Received for House Drain Permits	4,656.00
Received for Storm Drain Permits	1,258.00
Total	$12,806.00

UNIVERSITY OF ILLINOIS LIBRARY APR 1921

Report
Assessment Department

DEPARTMENT OF PUBLIC WORKS

For the Year

Ending December 31, 1920

COMPARATIVE STATEMENT

For What Purpose	Amount
To special assessments levied by the Department of Public Works for the year 1919	$ 988,760.15
Total special assessments levied by the Department of Public Works for the year 1920	1,048,209.56

GRAND RECAPITULATION

of special assessments for street and alley improvements, of street improvement bonds, of special assessments and water pipe assessments by the Department of Public Works.

For What Purpose	Amount
Street improvement installments for 1920	$ 144,338.59
Street improvement installments prior to 1920	416.988.49
Special assessments for sewers	33,439.03
Special assessments for opening streets and alleys	106,351.69
Special assessments for vacating streets and alleys	181.09
Special assessments for laying water pipe	58,942.66
Special assessments for laying house drains and water connections	71,670.90
Special assessments for laying cement sidewalks	34,298.38
Special assessments for oiling streets	91,786.45
Special assessments for removing earth from sidewalks	1,393.64
Special assessments for cutting noxious weeds	8,656.35
Special assessments for removing snow from sidewalks	22,171.96
Special assessments for miscellaneous work	24,060.33
Special assessments for condemnation of lands for public square	33,930.00
Total	$1,048,209.56

RECAPITULATION

of assessments levied by the Department of Public Works for stree and alley improvements during the year 1920.

Ward	Total Cost of 1920 Assessable Work	Installment for 1920
First		
Second	$ 2,511.44	$ 418.57
Third	18,740.68	3,170.73
Fourth	3,531.48	588.58
Fifth	60,577.68	10,096.34
Sixth	47,796.51	7,966.07
Seventh		
Eighth	20,895.78	3,482.71
Ninth	3,981.58	663.61
Tenth	14,722.83	2,453.77
Eleventh	11,755.46	2,662.36
Twelfth	32,581.81	5,430 37
Thirteenth	13,015.27	2,169.30
Fourteenth	24,760.48	4,181.32
Fifteenth	2,055.25	342.53
Sixteenth	16,255.18	2,709.22
Seventeenth	11,776.06	9,487.26
Eighteenth		
Nineteenth	25,096.28	4,182.81
Twentieth	138,260.04	38,880.21
Twenty-first	34,718.40	5,793.04
Twenty-second	53,562 38	8,949.44
Twenty-third	97,022.61	16,170.32
Twenty-fourth	11,128.65	5,017.51
Twenty-fifth	49,223.93	9,522.52
Total Amounts	$693,969.78	$144,338.59

RECAPITULATION

of assessments levied by the Department of Public Works for th construction of main sewers during the year 1920.

No. of Assessments	Amount
934	$33,439.0

OPENING AND EXTENSION OF STREETS AND ALLEYS

The damages awarded for the property proposed to be taken i the several proceedings were $361,004.54, of which amount the sur of $106,351.69 was assessed as benefits to surrounding property an $254,652.85 was chargeable to Street and Alley Opening Fund.

The benefits assessed for the property proposed to be vacated i the several proceedings were $6,063.64, of which amount the sum o $1,590.00 was awarded as damages and $4,473.64 was assessed a benefits to surrounding property.

The damages awarded for property proposed to be taken for Public Square at Wells, West Water and Second Streets, in th Fourth Ward, were $91,021.49.

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR OPENING STREETS AND ALLEYS

Ward	STREET	FROM	TO	Damages Awarded for Property Taken	Benefits Assessed Against Property	Amount Chargeable to Street and Alley Fund
14 17 24	Oklahoma Ave.....	Lake Michigan	West City Limits.....	$183,127.02	$55,486.36	$127,640.66
20 21 25	Lake Street	Milwaukee River.....	West City Limits.....	177,877.52	50,865.33	127,012.19
			TOTALS.....	$361,004.54	$106,351.69	$254,652.85

THE FOLLOWING IS A LIST OF THE SEVERAL ASSESSMENTS FOR VACATING STREETS AND ALLEYS

Ward	STREET	FROM	TO	Benefits Assessed Against Property	Damages Awarded	Excess of Benefits
2	Alley, Block 32,	between Poplar and Cherry Streets and East of Commerce Street		$ 314.30	.....	$ 314.30
6	Ship Street	Commerce Street	Green Bay Canal	928.40	.....	928.40
8	Part of North and South alley in Block 141, L. W. Weeks' Subdivision,	between Lapham and Mitchell Streets and between Fifth and Sixth Aves		800.00	$ 800.00	.....
15	Chestnut Street	38th Street	West Line of 40th Street			
	39th and 40th Streets	Chestnut Street	Highland Boulevard			
	Alleys, in Blocks 8 and 9,	between 38th and 40th Streets, and Chestnut St. and Highland Blvd		3,049.85	.....	3,049.85
20	Parts of North and South Alley,	between 25th and 26th Streets, and between Auer Ave. and Burleigh Street		330.00	330.00	.....
20	East and West alley,	between Right of Way of the C. M. & St. P. Ry. Co., and 30th Street and between Cawker Place and Locust Street		460.00	460.00	.....
20	Alley running Easterly and Westerly in Block 5, Fond du Lac Ave. Heights,	from 34th Street to Lot 3, Cawker's Subdivision, between Burleigh Street and Fond du Lac Ave		181.09	.....	181.09
	TOTAL			$6,063.64	$1,590.00	$4,473.64

S

Ward	
1	...
2	...
3	...
4	...
5	...
6	...
7	...
8	...
9	...
10	...
11	...
12	...
13	...
14	..
15	...
16	..
17	...
18	..
19	..
20	$
21	
22	
23	..
24	
25	
*	..
	$

*To'al a

VERSITY OF ILLINOIS LIBRARY



STATEMENT OF SPECIAL ASSESSMENTS LEVIED DURING THE YEAR ENDING DECEMBER 31, 1920

Ward	Sewers	House Drains and Water Connections	Water Pipe	Repairing and Constructing Cement Sidewalks	Oiling Streets	Removing Earth from Sidewalks	Cutting Noxious Weeds	Removing Snow from Sidewalks	Opening Streets and Alleys	Vacating Streets and Alleys	Miscellaneous	Grand Total	Ward
1				$ 1,532.32	$ 3,758.66		$ 193.50	$ 618.00			$ 53.23	$ 6,155.71	1
2				216.58	2,330.53			220.25			65.95	2,833.26	2
3		$ 518.50	$ 479.13	755.32	1,991.88		77.60	1,133.50			79.19	5,035.12	3
4				3,660.44	1,287.96		76.20	247.25			68.84	5,340.69	4
5		1,092.70		1,642.05	3,736.12	$ 19.00	26.10	372.95			320.80	7,209.72	5
6					7,016.73		55.80	125.50			9.83	7,207.86	6
7					553.40		17.80	149.25			39.50	759.95	7
8				615.69	6,694.12		1.80	131.03			139.84	7,582.48	8
9				91.03	1,876.95	23.00	26.10	117.71			28.30	2,163.09	9
10					7,219.07		33.45	108.05			5.60	7,366.17	10
11		252.00		295.52	2,110.88	272.00	277.65	1,295.50			82.08	4,585.63	11
12				2,538.05	6,795.94		97.20	196.50			26.67	9,654.36	12
13				249.30	5,981.78		49.80	503.05			746.41	7,530.34	13
14		2,808.50	69.42	1,499.17	704.20	270.00	755.23	1,612.40	$ 22,414.03		13.67	30,146.62	14
15				1,534.91	2,637.87		266.80	201.12			2,067.24	6,707.94	15
16				1,402.56	2,459.91		379.80	317.25			153.17	4,712.69	16
17			4,030.16	1,052.60	1,878.31	289.34	884.70	1,165.00	31,991.83		94.56	41,386.50	17
18				5,778.62	2,520.34	165.00	985.66	3,915.75			20.19	13,385.56	18
19		324.00	300.69	2,557.11	3,483.79	3.00	403.94	911.94			50.18	8,034.65	19
20	$ 8,025.68	6,118.70	3,783.80	319.22	4,850.95		582.25	2,025.49	2,604.86	$181.09		28,492.04	20
21	8,576.00	9,626.20	13,949.33	2,036.64	6,727.92	97.10	1,177.40	1,176.25	30,101.08		1,118.15	74,586.07	21
22	6,965.57	5,332.10	15,857.94	2,838.60	607.28		571.00	1,509.35			196.15	33,877.99	22
23		3,572.00	1,412.27	2,037.56	2,401.15	194.30	392.38	1,503.16			206.99	11,719.81	23
24	261.60		14,239.15	300.49	4,397.30		339.05	797.20	1,080.50		185.77	21,601.06	24
25	9,610.18	42,026.20	4,820.77	1,344.65	7,763.41	60.90	985.14	1,818.51	18,159.39		30.43	86,619.58	25
*											*18,257.59	18,257.59	
	$33,439.03	$71,670.90	$58,942.66	$34,298.38	$91,786.45	$1,393.64	$8,656.35	$22,171.96	$106,351.69	$181.09	$24,060.33	$452,952.48	

*Total assessment for planting, pruning, spraying and removing trees.

Report of the

Bureau of Street Construction and Repair

For the Year Ending
December 31
1920

December 21, 1920.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

I am herewith submitting report of the activities of the Bureau of Street Construction and Repair for the year 1920, which shows in detail the various types of pavement laid, square yardage of each street and alley, the cost thereof and the contractor who performed the work.

Yours very truly,

C. J. VAN ETTA,
Supt. Street Const. and Repair.

STANDARD SHEET ASPHALT PAVEMENT

STREET	Sq. Yds. Paved	Cost	Contractor
Wisconsin Street, Marshall to R. O. W. Railway	1,885.47	$3.90	White Construction Co.
Marshall Street, Wisconsin to Michigan	1,548.10	3.90	White Construction Co.
Richards Street, Franklin to Lake	5,028.19	3.90	White Construction Co.
Mitchell Street, Kinnickinnic to Pt. 114 ft. W. of 7th Ave	14,216 10	3.90	White Construction Co.
17th Street, H. A. Mendels' Subd. to Davis	1,219.51	3.90	White Construction Co.
Cherry Street, 54th Street to Hawley Road	1,017.46	3.67	Badger Construction Co.
Wells Street, 24th to 26th Street	2,250.27	3.49	F. P. Caughlin
American Ave., Manitoba to Dakota	2,127.12	3.48	White Construction Co.
S. Pierce Street and Shea Ave., 15th to 27th Aves	16,613.69	3.54	White Construction Co.
9th Ave., Dakota to Pt. 558 ft. N. Dakota	1,708.38	3.48	F. P. Caughlin
Concordia Ave., 20th to 21st Streets	920.59	3.70	F. P. Caughlin
Van Buren Street, intersection of Mason	494.09	3.80	F. P. Caughlin
	49,028.97 Sq. yards.		
	AVERAGE COST—$3.71		

LIGHT TRAFFIC ASPHALT PAVEMENT

Windsor Ave., Spring to W'ly L. Elliott Circle	503.70	$3.44	White Construction Co.
59th Street, North Ave. to N'ly L. Elliott Circle	849.80	3.44	White Construction Co.
59th Street, Pabst Ave. to S'ly L. Elliott Circle	1,166.72	3.44	White Construction Co.
58th Street, Pabst Ave. to S. L. Elliott Circle	1,212.05	3.44	White Construction Co.
Ontario Street, Superior to Beulah	1,051.66	3.65	White Construction Co.
Townsend Street, 20th to 24th Streets	3,466.88	2.50	F. P. Caughlin (1919)
20th Street, Keefe Ave. to Franklin Street	2,039 52	2.50	F. P. Caughlin (1919)
Locust Street, 33rd to 35th Streets	2,327.82	2.50	Badger Const. Co. (1919)
	12,618.15 Sq. yards		
	AVERAGE COST—$3.71		

ASPHALT RESURFACE

Wells Street, 33rd to 35th Streets	1,438.05	$2.60	Badger Construction Co.
Meinecke Ave., 39th to Sherman Blvd.	4,656.75	2.20	F. P. Caughlin
Wright Street, 39th to Sherman Blvd.	4,612.03	2.20	F. P. Caughlin
	10,706.83		

GRANITE BLOCK PAVEMENT

STREET	Sq. Yds. Paved	Cost	Contractor
Canal Street, 1st to Muskego Aves	15,134.31	$4.17	Kroening Const. Co. (1919)
Canal Street, Muskego Ave. to 20th Street	10,050.09	5.80	Milw. Gen'l.
Cape Street, Ship to Cherry Streets	2,663.20	5.74	A. H. Prange
Cape Street, Ship to Walnut Streets	2,353.88	5.36	A. H. Prange
Cawker Place, R. R. Tracks to 30th Street	1,250.48	6.00	M. Switalski
	31,452.96 Sq. yards		
	AVERAGE COST—$4.98		

SANDSTONE PAVEMENT

Washington Street, Clinton to Pt. 230 ft. E. of Davidson	5,036.11	$5.33	Dean Const. (1919)
Becher Street, Clinton to River	2,580.66	4.65	J. Weiher (1919)
	7,616.77 Sq. yards		
	AVERAGE COST—$5.09		

CEMENT CONCRETE PAVEMENT

Wright Street, Dousman to Bolton Street	979.55	$2.62	Retzlaff, Froemming & Bluhm

SIDEWALKS

	Sq. Ft. Laid		
Cawker Place, R. R. Tracks to 30th Street	1,996.80	$0.35	M. Switalski
Pabst Ave., 28th to Western (N. side)	2,354.40	.26¾	F. Banaszak
27th Ave., Lincoln to Burnham (E. side)	1,591.40	.28	F. Banaszak
Atkinson Ave., Green Bay to 11th Street (N. side)	4,962.46	.29	F. Banaszak
Wright Street, Dousman to Bolton	481.58	.16½	Froemming Bros. (1919)
29th Street, Concordia to Townsend	5,852.70	.14½	F. Schoman (1919)
Ontario Street, Superior to Beulah	3,670.80	.23	White Const. Co. (1919)
Townsend Street, 20th to 24th Street	12,834.66	.17½	Caughlin (1919)
20th Street, Keefe to Franklin	5,341.10	.17½	Caughlin (1919)
Locust Street, 33rd to 35th Streets	4,540.20	.16¾	Badger (1919)
Marshall Street, Wisconsin to Michigan	7,483.60	.30	White Const. Co.
Wisconsin Street, Marshall to R. O. W. Railway	1,618.46	.30	White Const. Co.
Richards Street, Franklin to Lake	13,235.76	.28	White Const. Co.
17th Street, H. A. Mendels' Subd. to Davis	3,604 90	.23	White Const. Co.
Cherry Street, 54th to Hawley Road	5,123.40	.25	Badger Const. Co.
American Ave., Manitoba to Dakota	131.63	.24	White Const. Co.

SIDEWALKS—Continued

STREET	Sq. Ft. Laid	Cost	Contractor
Concordia Ave., 20th to 21st Street	3,002.40	.20	Caughlin Const. Co.
59th Street, Pabst to Elliott Circle	5,958.00	.25	White Const. Co.
59th Street, North Ave., to N'ly L. Elliott Circle	4,591.58	.25	White Const. Co.
Windsor Ave., Spring to Elliott Circle	2,483.70	.25	White Const. Co.
Washington Street, Clinton to Pt. 230 ft. E. of Davidson	3,951.00	.20	Dean Const. Co. (1919)
58th Street, Elliott Circle to Pabst Ave	6,520.30	.25	White Const. Co.
	101,330.83 Sq. feet		
	AVERAGE COST—$0.23		

ALLEYS PAVED IN 1920

CEMENT CONCRETE

Ward	Sq. Yds. Paved	Cost	Contractor
2—Alley bet. 13th, 14th, Cedar and State	837.60	$2.55	Kehrein Const.
3—Alley bet. Juneau, Knapp, East Water and Market	558.62	2.45	Banaszak
4—Alley bet. 16th, 17th, Clybourn and Grand Ave	651.26	2.35	Switalski
Alley bet. 12th, 13th, Wells and Cedar	473.52	2.48	Milw. Genl.
5—Alley bet. Washington, Scott, Hanover and Reed	650.27	2.19	Banaszak
Alley bet. Greenbush, Grove, Florida and Virginia	665.54	2.36	Banaszak
6—Alley bet. 4th, 5th, Walnut and Galena	1,588.41	2.35	Froemming Bros.
Alley bet. 6th, 7th, Walnut and Galena	995.86	2.55	Retzlaff, Froemming & Bluhm
Alley bet. 8th, 9th, North and Garfield	629.76	2.50	Froemming Bros.
Alley bet. 5th, 6th, Cherry and Galena	1,627.34	2.45	Froemming Bros.
Alley bet. 5th, 6th, Walnut and Sherman	876.27	2.45	Froemming Bros.
Alley bet. 1st, 2nd, Reservoir and Sherman	975.09	2.45	Froemming Bros.
Alley bet. 8th, 9th, Harmon and Lloyd	730.51	2.50	Froemming Bros.
9—Alley bet. 23rd, 24th, Vine and Walnut	525.39	2.31	Blodgett
Alley bet. 20th, 21st, Vliet and Cherry	849.72	2.31	Blodgett
Alley bet. 12th, Sheridan Lane, Vliet and Cherry	250.80	2.75	Dean
10—Alley bet. 10th, 11th, Lloyd and Harmon	728.19	2.47	Diamond "C"
Alley bet. 19th, 20th, Lloyd, Fond du Lac and Elm	1,049.53	2.38	Kehrein
Alley bet. 12th, 13th, Walnut, Fond du Lac and Sherman	664.76	2.42	Retzlaff, Froemming & Bluhm
Alley bet. 10th, 11th, Sherman and Walnut	454.22	2.52	Retzlaff, Froemming & Bluhm
Alley bet. 10th, 11th, Harmon and Vine	450.27	2.48	Retzlaff, Froemming & Bluhm

Ward		Sq. Yds. Paved	Cost	Contractor
10—	Alley bet. 13th, 14th, Fond du Lac and Wine	1,013.99	1.68	R., F. & B. (1919)
	Alley bet. 10th, 11th, Wine and Sherman	1,037.83	1.68	R., F. & B. (1919)
	Alley bet. 24th, W. 24th, Lloyd and Elm	479.07	2.31	Blodgett
	Alley bet. 20th, 21st, Elm and Fond du Lac	502.11	2.31	Blodgett
11—	Alley bet. 25th, 26th, Orchard and Lapham	1,044.91	2.25	Ryback & Sadowski
	Alley bet. 26th, 27th, Lapham and Mitchell	1,383.71	2.25	Ryback & Sadowski
	Alley bet. Lapham, Mitchell, 20th and 21st Ave	1,655.63	2.25	Ryback & Sadowski
13—	Alley bet. Lee, Walworth, Humboldt and Stanley	1,103.60	2.50	Retzlaff, Froemming & Bluhm
	Alley bet. Fratney, N. Pierce, Wright and Clarke	1,291.57	2.34	Blodgett
	Alley bet. Booth, Holton, Lee and North	1,320.94	2.34	Blodgett
14—	Alley bet. 3rd, 4th, Arthur and Harrison	1,439.46	2.25	Gumz
	Alley bet. 5th, 6th, Hayes and Arthur	1,260.52	2.24	Banaszak
	Alley bet. Harrison, Arthur, American and 10th	1,166.02	2.24	Banaszak
15—	Alley bet. 26th, 27th, Cedar and State	818.47	2.34	Blodgett
16—	Alley bet. 30th, 31st, St. Paul and Clybourn	502,94	2.70	Dean
	Alley bet. 34th, 35th, Clybourn and St. Paul	822.36	2.45	Switalski
	Alley bet. 32nd, 33rd, Mt. Vernon and Park Hill	972.27	2.45	Switalski
19—	Alley bet. 33rd, 34th, Lisbon and Vine	312.21	2.65	Dean
	Alley bet. Lisbon, Vine, 25th and 26th Streets	328.50	2.30	Blodgett
	Alley bet. 38th, 40th, Roberts and Walnut	785.68	2.32	Blodgett
	Alley bet. 37th, 38th, Brown and Pabst	688.33	2.32	Blodgett
	Alley bet. 41st, 42nd, Lisbon and Pabst	674.12	2.33	Blodgett
	Alley bet. 32nd, 33rd, Galena and Walnut	934.01	2.30	Koehn
	Alley bet. 35th, 37th, Vliet and Cherry	807.43	2.56	Retzlaff, Froemming & Bluhm
	Alley bet. 52nd, 53rd, Vine and Pabst	965.49	2.00	Bodemann
	Alley bet. 39th, 40th, Cherry and Galena	1,666.32	2.00	Bodemann
	Alley bet. 32nd, 33rd, Galena and Cherry	728.86	2.45	Bodemann
20—	Alley bet. 37th, 38th, Hadley and Locust	1,217.27	2.15	Bodemann
	Alley bet. Grant Blvd., Sherman, Hadley and Locust	1,381.84	2.15	Bodemann
	Alley bet. 29th, 30th, Burleigh and Auer	1,247.15	2.00	Bodemann
	Alley bet. 38th, 39th, Locust and Chambers	1,200.12	2 15	Bodemann
	Alley bet. 38th, 39th, Hadley and Locust	1,216.35	2.15	Bodemann
	Alley bet. 20th, 21st, Locust and Chambers	1.056.95	2.45	Bodemann
	Alley bet. 24th, W. 24th, Locust and Chambers	1,066.60	2.45	Bodemann
	Alley bet. 33rd, 34th, Center and Hadley	1,171.42	2.37	Blodgett
	Alley bet. 40th, 41st, Locust and Chambers	932.77	2.42	Ryback & Sadowski

ALLEYS PAVED IN 1920—Continued

Ward	Sq. Yds. Paved	Cost	Contractor
20—Alley bet. 26th, 27th, Auer and Concordia	1,801.30	2.39	Retzlaff, Froemming & Bluhm
Alley bet. 27th, 28th, Hadley and Locust	1,408.21	2.36	Retzlaff, Froemming & Bluhm
Alley bet. 40th, 41st, Chambers and Burleigh	946.39	2.39	Retzlaff, Froemming & Bluhm
Alley bet. 29th, 30th, Locust and Chambers	1,371 77	2.36	Retzlaff, Froemming & Bluhm
Alley bet. 28th, 29th, Hadley and Locust	1,408.88	2.36	Retzlaff, Froemming & Bluhm
Alley bet. 28th, 29th, Locust and Chambers	1,374.84	2.36	Retzlaff, Froemming & Bluhm
Alley bet. W. 24th, 25th, Hadley and Locust	1,537.03	2.48	Retzlaff, Froemming & Bluhm
Alley bet. 27th, 28th, Auer and Concordia	1,959.06	2.20	Switalski
Alley bet. 27th, 28th, Locust and Chambers	1,375.06	2.22	Switalski
Alley bet. 27th, 28th, Burleigh and Auer	1,683.26	1.70	Blodgett (1919)
Alley bet. 25th, 26th, Burleigh and Auer	1,727.15	2.48	Retzlaff, Froemming & Bluhm
Alley bet. 29th, 30th, Chambers and Burleigh	1,430.00	2.48	Retzlaff, Froemming & Bluhm
Alley bet. 28th, 29th, Chambers and Burleigh	1,440.29	2.36	Retzlaff, Froemming & Bluhm
Alley bet. 24th, W. 24th, Burleigh and Auer	1,787 02	2.33	Retzlaff, Froemming & Bluhm
Alley bet. 27th, 28th, Chambers and Burleigh	1,439.00	2.35	Retzlaff, Froemming & Bluhm
Alley bet. 41st, Grant, Hadley and Locust	1,217.75	2.38	Retzlaff, Froemming & Bluhm
21—Alley bet. N. Pierce, Fratney, Brattle and Keefe	2,008.40	1.65	Kehrein (1919)
22—Alley bet. 38th, 39th, Clarke and Center	791.49	2.36	Blodgett
Alley bet. 55th, 56th, Pabst and Elm	1,192.10	1.68	Milw. Genl. (1919)
Alley bet. 55th, 56th, Elm and North	904.96	2.00	Bodemann
Alley bet. 56th, 57th, North and Elm	905.89	2.00	Bodemann
Alley bet. 39th, 40th, Clarke and Center	1,219.87	2.35	Bodemann
Alley bet. 47th, 48th, North and Meinecke	1,519.79	2.40	Bodemann
Alley bet. 57th, 58th, Elm and Pabst	1,310.37	2.00	Bodemann
Alley bet. 47th, 48th, Elm and North	724.26	2.30	Bodemann
23—Alley bet. 26th, 28th, Madison and Greenfield	828.60	2.36	Blodgett
Alley bet. 10th, 11th, Walker and National	658.15	2.34	Milw. Genl.
Alley bet. Scott, Fredericka, 32nd and Trowbridge	458.17	1.69	Banaszak (1919)
Alley bet. 17th, 18th, National and S. Pierce	554.01	2.33	Banaszak
Alley bet. 32nd, 33rd, National and S. Pierce	1,231.59	2.21	Banaszak
24—Alley bet. 26th, 27th, Becher and Grant	1,334 37	2.30	Ryback & Sadowski
Alley bet. Becher, Grant, 21st, and Layton Blvd	1,673.27	2.25	Ryback & Sadowski
25—Alley bet. 14th, 15th, Davis and Finn Pl	1,119.53	2.40	Switalski
Alley bet. Louis, 14th, Burleigh and Ring	2,452.17	2.39	Retzlaff, Froemming & Bluhm
Alley bet. 11th, 12th, Burleigh and Ring	2,295.31	2.40	Blodgett

ALLEYS PAVED IN 1920—Continued

Ward	Sq. Yds. Paved	Cost	Contractor
25—Alley bet. 8th, 9th, Concordia and Davis	1,611.69	2.39	Blodgett
Alley bet. 11th, 12th, Concordia and Davis	2,143.45	2.39	Blodgett
Alley bet 17th, 18th, Davis and Finn Pl	480.78	2.35	Bodemann
Alley bet. 10th, 11th, Ring and Concordia	950.61	2.35	Bodemann
Alley bet. Louis, 12th, Concordia and Ring	952 53	2.35	Bodemann
Alley bet. 14th, 15th, Ring and Concordia	561.02	2.35	Bodemann
Alley bet. 15th, 14th, Burleigh and Ring	465.36	2.45	Bodemann
Alley bet. 9th, 10th, Ring and Concordia	950.56	2.35	Bodemann
Alley bet. 14th, 15th, Nash and Atkinson	861.05	2.45	Bodemann
	109,213.09 Sq. Yards		
	AVERAGE COST—$2.29		

REPAIR DIVISION

In submitting yardage and cost for the year 1920, you will noti that we fell short of last year's work. Our asphalt amounting 71,955 sq. yds., a total cost of $57,307.74 and an average cost $.796 a sq. yd. This is slightly higher than last year, due to t increased cost of labor alone.

Our bituminous macadam was 229,293 sq. yds., costing $16 216.89, an average cost of $.799.

Block paving was 30,389 sq. yds. costing $47,779.01, an avera cost of $1.572.

Waterbound macadam was 10,424 sq. yds., costing $1,959.22, average cost of $.187.

Due to the increased cost of material and the wage increase, has raised the different amounts considerably. Lots of time was l due to embargo on cars and inability to get material. This ye cannot be taken as a fair average of work.

Respectfully submitted,

C. J. VAN ETTA,
Supt. Street Const. and Repair

STATEMENT OF YARDAGE AND COST FOR THE YEAR 192

	ASPHALT REPAIRS		PLANT	
April	15,171 sq. yds	$ 6,428.57	1,167 cu. yds	$ 4,99
May	11,843 sq. yds	4,358.45	911 cu. yds	3,96
June	10,816 sq. yds	5,304.20	832 cu. yds	3,73
July	10,712 sq. yds	4,449.57	824 cu. yds	3,43
August	11,258 sq. yds	4,630.89	866 cu. yds	4,27
September	5,343 sq. yds	1,911.52	411 cu. yds	2,46
October	4,524 sq. yds	2,031.46	348 cu. yds	2,66
November	2,288 sq. yds	1,220.14	176 cu. yds	1,43
	71,955 sq. yds.	$30,334.80	5,535 cu. yds.	$26,97
	AVERAGE COST—$.421		AVERAGE COST—$4.873 cu.	

TOTAL AVERAGE COST—$

BITUMINOUS MACADAM

	Sq. Yards	
May	4,362	$ 2,46
June	36,882	27,15
July	36,552	25,75
August	51,956	37,68
September	51,824	37,44
October	47,717	32,71
	229,293	$163,21

AVERAGE COST—$

BLOCK PAVING

	Sq. Yards	
ril	4,878	$ 10,790.36
y	5,185	8,130.30
ne	5,030	6,938.02
ly	5,641	7,616.15
gust	4,111	4,558.55
ptember	3,374	4,083.25
tober	1,886	5,153.34
vember	284	509.04
	30,389	$47,799.01
AVERAGE COST		$1.572

WATERBOUND MACADAM

	Sq. Yards	
ne	10,424	$1,959.22
AVERAGE COST		$.187

Department of Public Works

Bureau of Street Sanitation

Annual Report

1920

Milwaukee, January 2, 1921.

Mr. Percy Braman,
Deputy Commissioner of Public Works,
Milwaukee, Wisconsin.

Dear Sir:

Following is the Annual Report of the Bureau of Street Sanitation for the year ending December 31st, 1920, showing detailed report of the work performed and statements of the cost incurred therein:

Cleaning Streets and Alleys.
Ash and Rubbish Collection.
Garbage Collection.
Collection and Removal of Dead Animals.
Catch Basin Cleaning.
Sprinkling.
Flushing.
Minor Street Repairs.
Oiling.
Snow Removal.
Drinking Fountains.
Cutting Weeds.
Election Booths.
Miscellaneous Assessable Service.
Miscellaneous General Service.

CLEANING STREETS AND ALLEYS

During the year 1920, 84,985 cubic yards of sweepings were removed.

The cost of labor and team hire for cleaning streets and alleys for the entire season of 1920 was as follows:

Labor	$113,587.62
Team	47,900.50
Machine	4,561.89
Whitewing	70,981.90
	$237,031.91

From January 1, 1920, to June 30, 1920, labor was paid at the rate of 50¢ per hour; from July 1, 1920, to December 31, 1920, at the rate of 60¢ per hour. Teams were rated at $8.00 per day.

ASH AND RUBBISH COLLECTION

The following is a comparison of the yardage and cost of collection for the past ten years:

1920	Collection—440,276 cubic yards	$465.556.90
1919	Collection—394,865 cubic yards	369,629.45
1918	Collection—356,786 cubic yards	281,995.12
1917	Collection—366,120 cubic yards	266,905.05
1916	Collection—333,375 cubic yards	216,496.62
1915	Collection—320,373 cubic yards	211,939.83
1914	Collection—321,669 cubic yards	226,219.24
1913	Collection—379,848 cubic yards	225,421.50
1912	Collection—293,646 cubic yards	229,344.26
1911	Collection—188,737 cubic yards	174,619.51

AVERAGE COST PER CUBIC YARD

1920	$1.06
1919	.94
1918	.79
1917	.70
1916	.65
1915	.66
1914	.70
1913	.70
1912	.78
1911	.93

Wages paid labor and teams were at the same rates as those shown under the caption "Cleaning Streets and Alleys."

As compared with the figures for the year 1919, there is an increase of 12¢ in the average cost per cubic yard. This is due to the increase of wages to laborers as well as to teams. The cost would be materially greater but for the efforts of the superintendent in procuring dumping privileges for various places in the city, convenient and necessitating short hauls.

STATEMENT OF ASH AND RUBBISH COLLECTION 1920

Month	Cubic Yards	Labor and Team Cost
January	59,548	$ 60,480.61
February	69,673	69,156.25
March	53,182	55,413.04
April	52,158	53,616.58
May	40,789	36,161.72
June	29,586	32,031.15
July	17,963	20,473.77
August	11,745	14,879.93
September	13,084	10,795.80
October	16,871	20,663.70
November	28,395	34,591.50
December	47,282	57,292.85
	440,276	$465,556.90

GARBAGE COLLECTION

The following are statements of garbage collection in 1920 and comparative cost per ton for the past nine years:

STATEMENT OF GARBAGE COLLECTION 1920

Month	Loads	Tons	Cost of Collection
January	5,380	1,981	$ 15,906.00
February	4,594	1,737	13,533.00
March	5,211	2,312	15,351.00
April	5,239	2,438	15,702.00
May	5,539	2,476	16,911.00
June	6,689	3,074	19,785.00
July	7,074	3,177	21,000.00
August	6,846	3,419	20,520.00
September	7,002	3,967	20,730.00
October	7,010	3,747	20,760 00
November	5,756	2,753	17,016.00
December	6,071	2,699	17,940.00
	72,411	33,780	$215,154.00

Average weight of load ---- 933 pounds
Average Cost of Collection, per ton ---- $6.37

1920	$6,37
1919	5.43
1918	4.83
1917	4.18
1916	3.07
1915	2.87
1914	2.94
1913	2.42
1912	2.47

The wages paid to the collectors in 1920 were at the rate of $6.00 per day; in 1919, $5.00 per day.

Each collector must bring in two loads for a day's work.

COLLECTION AND REMOVAL OF DEAD ANIMALS

For this work we employed one permanent collector, and add a temporary collector during the warm months of the year. The wages paid were at the rate of $6.00 per day, this including the hire of horse and wagon.

Following is a statement of the work performed:

Month	Animals	Cost of Collection
January	229	$ 156.00
February	231	144.00
March	291	168.00
April	271	156.00
May	313	156.00
June	362	174 00
July	337	318.00
August	333	312.00
September	307	300.00
October	293	156.00
November	240	156.00
December	220	156.00
	3,427	$2,352.00

Average cost of collection amounted to $.69 per animal.

CATCH BASIN CLEANING

The following is a statement of work done and itemized cost:

Month	Total Cu. Yds. Removed	Cost of Cleaning
January	-----	---------
February	-----	---------
March	127	$ 546.00
April	48	92.50
May	301	524.40
June	931	1,459.45
July	2,514	3,474.82
August	3,519	5,136.63
September	3,456	4,211.53
October	3,142	3,689.29
November	775	444.70
December	-----	---------
	14,813	$19,579.33

Average cost of removing amounted to $1.32 per cubic yard.

SPRINKLING

The following is a statement of the cost of street sprinkling:

January	--------
February	--------
March	$ 104.00
April	347.00
May	3,824.00
June	5,440.00
July	7,020.50
August	6,446.00
September	6,821.00
October	4,276.00
November	491.00
December	112.00
	$34,881.50

83,606,376 gallons of water were used for street sprinkling at a cost of $5,016.38.

The charges for water used in sprinkling the track zone of The Milwaukee Electric Railway & Light Company, Chicago North Shore & Milwaukee Railroad and the Milwaukee Northern Railway Company amounted to $3,153.44.

Hydrant rent amounted to $9,570.00.

FLUSHING

The following is a statement of the cost of street flushing:

Month	Labor	Team	Total
January			
February	$ 12.00	$ 16.00	$ 28.00
March	294.00	876.00	1,170.00
April	300.00	1,504.00	1,804.00
May	591.00	2,786.50	3,377.50
June	1,202.73	3,859.00	5,061 73
July	1,602.25	4,735.00	6,337.25
August	1,758.80	4,674.00	6,432.80
September	1,796.42	4,581.00	6,377.42
October	1,880.38	4,274.00	6,154.38
November	1,473.80	1,106.00	2,579.80
December	865.90	433.00	1,298.90
	$11,777.28	$28,844.50	$40,621.78

77,142,035 gallons of water were used at a cost of $4,628.52. Hydrant rental charge amounted to $957.00.

MINOR STREET REPAIRS

The cost of minor street repairs performed by this department was as follows:

Labor	$22,883.90
Team	6,357.50
Material	9,357.70
	$38,599.10

This work consisted of emergency repairs of streets necessitated by cave-ins, washouts, etc., repairing of defective gutters and alley crossings; patching of waterbound macadam roadways to place them in condition for oiling; raising of cobble stone gutters in places where they would become settled, making drainage impossible; removing of street crossings of brick or stone and placing macadam instead, thus making the intersections uniform.

This department maintained between six and seven miles of dirt roads with grading machinery and cinders; also in over one hundred and fifty unimproved alleys, by the use of cinders, we made it possible for the property holders to approach garages with their machines through these alleys.

OILING

During the season, 36 miles of streets were oiled. The total cost of oiling, including cost of labor, team, oil and other materials, amounted to $102,212.33. Of this amount $91,786.45 was assessable; $24,458.20 for straight oiling and $67,328.25 for resurfacing and oiling macadam streets; $10,425.88 for non-assessable.

The non-assessable portion was for oiling street and alley intersections and streets abutting public property. The average rate of assessment per front foot was $.2755.

657,608 gallons of oil was used. Contract price of oil was as follows:

Barrett Manufacturing Company	.125
Standard Oil Company	.0805

Following is a comparison of street oiling during the past twelve years:

Year	Miles of Streets Oiled	Cost
1909	3	$ 1,585.85
1910	16	5,435.42
1911	71	34,281.34
1912	28	7,120.90
1913	101	54,786.44
1914	114	53,480.26
1915	122	54,578.86
1916	146	108,965.31
1917	126	115,693.39
1918	101	172,237.52
1919	142	252,259.94
1920	36	102,212.33

SNOW REMOVAL

The total cost of snow removal from streets, street intersections, crosswalks, gutters and private sidewalks amounted to $104,335.22.

Removing of snow from private walks, or assessable service. $15,623.63.

City's portion for removing snow from streets, gutters and public walks, $88,711.59.

DRINKING FOUNTAINS

During the year, a bubbler was installed and a fountain and walk built at the Pryor Avenue Artesian Well.

New bubblers were installed at Murray and North Avenues and at 4th Avenue and Mitchell Street.

The location of the bubbler at the corner of Marshall and Wisconsin Streets was changed.

The expenditure for repairs amounted to $830.49, and charges for water $7,700.00.

CUTTING WEEDS

Noxious weeds growing on private property are cut down when necessary and the cost of this work is assessed against the property. This work is done by hand and machine.

During the year $9,409.80 was spent for this purpose and assessed against the property.

UNIVERSITY OF ILLINOIS LIBRARY
APR - 3 1922

ELECTION BOOTHS

This department handles all election booths and equipment for the Election Commission, whenever necessary, and the expense incurred in doing this is paid by said Commission.

The expense of erecting, maintaining and removing booths in connection with the Spring and Fall elections amounted to $9,919.09.

MISCELLANEOUS ASSESSMENT SERVICE

The cost of this service is assessed against the property affected. It is as follows:

Removing earth from sidewalks	$1,585.17

PLOWING

During the season of 1920, the Bureau of Street Sanitation took full charge of the preparation of vacant lots for the Milwaukee City and County Agricultural Commission, of which body I am a member. The Commission now owns five plows, five disks and two harrows, and with this equipment, this department plowed and harrowed eight hundred vacant lots. Over five hundred of these were prepared for the gardeners at the actual cost of labor. The remaining were for worthy people and were paid for by the Commission.

Besides these vacant lots there were also prepared for cultivation several large plots covering a total of over twenty-three acres.

This department also greatly aided both vacant lot and back yard gardeners by hauling to them over five thousand loads of leaves and street sweepings to be used as fertilizer.

During the Fall and early Winter of 1920-1921, this department began work for the 1921 gardens by plowing the above mentioned and other tracts.

DREDGING KINNICKINNIC RIVER

In order to stop the overflowing of the Kinnickinnic River, occurring every Spring, the bed of this river was dredged between First and Tenth Avenues.

The total cost of this work amounted to $602.20.

This also eliminated a very unsanitary condition by keeping the water running during the warm weather, when otherwise it would become stagnant and create odors in a very thickly populated neighborhood.

WARD YARDS

New wagon sheds were established in the Second Ward Yard.

New office, men's room and tool room were built in the Twenty-first Ward Yard. This change made the building line conform with the abutting resident property on either side.

New wagon sheds and buildings were built in the Sixth Ward Yard, mostly from old material procured from the building razed on Market Street to make room for the new meter repair shop.

Erected office building, tool and men's room in the Fifteenth Ward Yard.

Made such minor repairs as were found necessary, on fences and buildings in the various ward yards.

In the Sixteenth Ward, we procured land adjoining the present ward yard, upon which buildings will be erected this year.

Respectfully submitted,

CHAS. O. DAVIS,
Supt., Bureau of Street Sanitation.

Report of

Bureau of Bridges and Public Buildings

1920

May 2nd, 1921.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

I herewith present the annual report of the Bureau of Bridges and Public Buildings for the year ending December 31, 1920.

During the past year a smaller amount of work than is usual was done because of the difficulty in obtaining material, and the high prices of material and labor. Some projects, such as the building of Comfort Stations and Markets, were abandoned for this reason.

The two concrete docks at the foot of Johnson and Clinton Streets, begun during the year previous, were completed.

At the Incinerator Plant the anchorage of the concrete dock had given way and there was danger of the structure sliding into the river. Additional anchor rods and piles were placed to prevent this.

Among the larger undertakings of the bureau was the construction of the pile and timber revetment on the west side of Jones Island for the Harbor Commission. This work was not completed until the end of the year because of inability to get material.

A new concrete intake chamber was constructed at the Milwaukee River Flushing Tunnel on Lake Michigan to replace the old wooden structure which was in danger of collapsing.

The most important project begun was the construction of the new North Avenue Viaduct which is expected to cost, when completed, about $710,000.00. All of the footings, except those of the west river abutment, adjacent girder span pier, and those of the side approach, were completed during the past year. The retaining walls on the west end, and most of the backfilling therein, were also completed. A pile and timber trestle foot bridge was constructed north of the old bridge to provide for pedestrians. It is expected that dur- 1921, except for the side approach and paving on the viaduct proper, the work will be completed. Only the east comfort station will be equipped for the present.

Another project of considerable magnitude begun during 1920 was the reconstruction of 27th Street Viaduct roadway floor. About 70% of the material was contracted for, but some of it not being delivered until late in the year, it was not considered expedient to begin tearing up the old floor at the risk of having traffic tied up all winter in the event of bad weather shortening the construction season.

A government permit was obtained for the construction of State Street Bridge, but the necessary land has not yet been acquired. Plans are being completed for a bridge 80 feet in width with a 52 foot roadway.

The most important work of the Architectural Division was the construction of a Water Meter Repair Shop, McKinley Beach Bath House Addition, South View Hospital Additions and Alterations, and two cottages at Blue Mound Sanitarium. Other work of this

division will be found listed in Table 1. The completion of the additions to McKinley Beach Bath House and providing of additional lockers has been needed for several years. It has been only in cool seasons that the public could be provided for at this place without compelling them to wait for long periods of time. The additional facilities will almost double the number of people who can be accommodated.

FUTURE WORK

The most important work expected to be begun during 1921 and probable costs are as follows:

American Avenue Bridge across Kinnickinnic River	$ 10,000.00
Kinnickinnic River Flushing Tunnel Intake Chamber	11,200.00
State Street Bridge	425,000.00
Bridge Piling Repairs	30,000.00
Repairs to Milwaukee River Dam	11,000.00
Municipal Garage Addition	35,000.00
Public Markets	250,000.00
Comfort Stations	30,000.00
Prairie Street Natatorium	75,000.00
South View Venereal Disease Hospital	250,000.00
South View Boiler Installation	6,800.00
South Shore Bath House	70,000.00
Central Police Station Plumbing Installation	8,000.00

In addition to the work in progress or expected to be started in 1921, expenditures will be required for bridges as follows within the next 5 years:

Point Street Bridge	$ 125,000.00
Lincoln Ave. Bridge	400,000.00
Holton Street Viaduct	1,000,000.00
Sixteenth Street Viaduct	1,000,000.00
Cedar Street Bridge	800,000.00
Thirty-fifth Street Viaduct	850,000.00
Lake Street across Milwaukee River	300,000.00

In undertaking these projects, the engineering force of the bureau should be increased and paid salaries commensurate with the importance of the work.

As has been mentioned in previous annual reports, there is urgent need of more office space in the city hall. The efficiency of many departments is affected by their limited office space. There seems absolutely no way to remedy the condition except by requiring certain departments, notably the courts, to seek quarters outside the city hall, or to finish off the ninth floor into office quarters.

Another suggested change recommended for many years past is the removal of the power plant to a site outside of the city hall. This would reduce the high operating and maintenance costs now existing, reduce the vibration in the building, and provide space for other purposes.

Herewith attached are tables 1 to 21 inclusive, showing costs of the various activities of the bureau.

Respectfully submitted,

MANUEL CUTLER, Supt.,
Bureau of Bridges and Public Bldgs.

LIST OF TABLES

No. 1—Construction Work.
No. 2—Bascule Bridges.
No. 3—Swing Bridges.
No. 4—Stationary Bridges and Viaducts.
No. 5—Railroad Bridges.
No. 6—City Hall.
No. 7—Motor Car Records.
No. 8—Municipal Garage.
No. 9—Center Street Natatorium.
No. 10—North Ave. Natatorium.
No. 11—Prairie Street Natatorium.
No. 12—Greenbush Street Natatorium.
No. 13—Greenfield Ave. Natatorium.
No. 14—Jackson Street Natatorium.
No. 15—Fifth Ave. Natatorium.
No. 16—McKinley Park Bath House.
No. 17—South Shore Bath House.
No. 18—Summary Natatorium and Bathing Beaches.
No. 19—Miscellaneous.
No. 20—Overhead.
No. 21—Summary.

TABLE No. 1

CONSTRUCTION

Administration Building –South View Hospital	$ 93.25
Small Pox Building--South View Hospital	81.36
Laundry and Kitchen Building—South View Hospital	14,259.83
Alterations and Changes—South View Hospital	9,946.65
Blue Mound Sanatarium—Administration Bldg.	363.00
Blue Mound Sanatarium—Sewerage	116.93
Blue Mound Sanatarium—Infirmary	20.00
Blue Mound Sanatarium—Cottages 1 and 2	735.75
Blue Mound Sanatarium—Cottages 3 and 4	19,644.04
Blue Mound Sanatarium—Sidewalks to Cottages 3 and 4	996.85
State Street Bridge	914.10
Cedar Street Bridge	518.12
Twenty-seventh Street Viaduct Reconstruction	63,772.29
North Avenue Viaduct	105,338.37
North Ave. Foot Bridge	11,664.99
American Ave. Bridge	41.94
Cleveland Ave. Bridge	361.31
Becher Street Bridge Reconstruction	152.60
Stairway—27th and Greves Streets	65.12
New Market Shelters	844 60
Municipal Market Building	97.95
5th Ave. Natatorium	2,278.00
McKinley Park Bath House—New Addition	15,929.41
Bath House –South Shore	166.94
Prairie Street Natatorium	175.24
Comfort Stations—Grand Ave	420.76
3rd Unit—Store House	41.69
Dock—Foot of Johnson Street	5,717.44
Dock—Foot of Clinton Street	3,601.06
Timber Revetment—Jones Island	62,026.59
Water Meter Repair Shop	11,997.34
New Inlet Milwaukee River Flushing Tunnel	6,092.09
Toilet Rooms –Auditorium	245.12
Addition—Municipal Garage	570.20
Blacksmith Shop –Bridge Dept.	41.07
Stone Breakwater	5.76
Dock Repair at Garbage Plant	8,099.00
Remodeling Bank Building for Health Dept., 29th and North Sub. Station	962.05
Roof Repairs--Incinerator Plant	3,015.66
Roof Repairs—Central Police Station	660.85
Painting Bay View Police Station	635.74
Repairing Armory Building	503.89
Painting Police Station No. 5	655.04
Repairing Bottom of Inlet—McKinley Park Flushing Tunnel	204.92
Alterations—North Point Pumping Station	811.66
TOTAL	$354,886.57

UNIVERSITY OF ILLINOIS LIBRARY



TABLE No. 2

SHOWING COST OF OPERATING, REPAIRING AND MAINTAINING BASCULE BRIDGES

	OPERATION				REPAIRS AND MAINTENANCE														
	Labor	Supplies	Miscellaneous	Total Cost of Operation	Electrical Repairs	House Repairs	Roadway Repairs	Resurfacing Roadway	Sidewalk Repairs	Sidewalks Replaced	Machinery Repairs	Substructure Repairs	Superstructure Repairs	Painting	Miscellaneous	Total Repairs	Grand Total	No. of Bridge Openings
Broadway	$ 9,345 00	$ 210 81		$ 9,555 81	$ 258 60	$ 209 97	$126 72	$ 1,234 67	$ 13 77		$274 44	$ 15 39	$ 18 80		$ 65 41	$ 2,217 60	$ 11,776 31	9889
East Water	9,547 81	134 22		9,682 06	63 16	143 94	4 40	1,192 41		$300 37	84 03				27 18	1,815 49	11,297 55	9084
West Water	8,972 00	172 00		9,144 00	101 88	21 48	109 51		35 82		208 43	26 19	60 80			564 11	9,709 01	5,407
River Street	8,599 03	111 42		8,710 45	94 28	11 78	65 11	3,083 34		788 18	438 52		33 50	$340 50	15	4,855 15	13,565 60	4,194
Michigan Street	8,599 03	165 65		8,764 68	135 90	45 74	33 50		27 83		200 87				17 17	461 01	9,225 69	3,217
Grand Ave	8,972 00	176 08		9,149 88	141 78	3 40	17 84		3 10	715 18	149 44		40 13	1,811 30	72 70	2,754 97	11,904 85	3,191
Huron Street	8,599 03	97 15		8,696 18	69 96	32 25	73 90				15 70		433 08	2,582 90	15	3,238 24	11,934 42	62
6th Street	8,599 03	205 57		8,804 60	146 29	141 55	21 67	2,321 13	9 10		69 18		3 11	817 98	18 79	3,548 80	12,353 40	1,052
Lake Ave	8,599 03	171 24		8,770 27	140 47	258 65	69 16	1,846 56	12 30		608 98		39 16			2,977 28	11,747 55	525
Muskegon Ave	8,599 03	120 33	$611 64	9,331 00	37 56	171 76	7 40				342 41	34 30	6 60		535 61	1,155 64	10,486 64	1,283
16th Street	8,599 03	125 76		8,724 79	10 61	50 99			17 20		188 03	30 40	11 00		31 22	451 17	9,175 96	366
Kanawha	8,599 03	120 22		8,719 25	504 86	179 95	31 20	1,556 38			866 47	64 50		1,190 37	46 36	4,740 09	13,459 34	919
Oneida Street	8,599 03	104 64		8,703 67	108 82	68 37	71 60	3,032 15	11 10		48 11	52 80			34 52	3,427 45	12,131 12	3,176
Buffalo Street	8,972 00	225 07		9,197 07	49 50	32 89	73 80		29 30		201 63			1,084 94	7 57	1,479 63	10,677 60	4,804
TOTAL	$123,005 71	$2,141 06	$611 64	$125,758 41	$1,964 78	$1,632 34	$756 80	$14,266 62	$159 32	$1,803 73	$4,026 24	$228 58	$646 28	$7,328 08	$857 36	$33,664 93	$159,423 34	

Repairs for Damages by Boat—Broadway Bridge	$12 24	
Repairs for Damages by Boat—Huron St Bridge	6 54	
Repairs for Damages by Boat—Holton St Viaduct	41 60	
Repairs for Damages by Boat—Muskegon Ave Bridge	14 20	
Repairs for Damages by Boat—Sixth St Bridge	13 16	$87 74
		$159,511 08

TABLE No. 3

SHOWING COST OF OPERATING, REPAIRING AND MAINTAINING SWING BRIDGES

	OPERATION				REPAIRS AND MAINTENANCE													
	Labor	Supplies	Miscellaneous	Total Cost of Operation	Electrical Repairs	House Repairs	Roadway Repairs	Resurfacing Roadway	Sidewalk Repairs	Sidewalk Replaced	Machinery Repairs	Substructure Repairs	Superstructure Repairs	Painting	Miscellaneous	Total Repairs	Grand Total	No. of Bridge Openings
Pleasant	$ 8,599 03	$ 122 60		$ 8,721 63	$ 45 79	$ 13 90	$106 21		$ 10 96		$ 33 74	$ 62 46				$ 273 06	$ 8,994 69	129
Cherry and Point	8,599 03	213 46		8,812 49	132 61	27 20	126 94	$ 511 98	44 02		19 70	58 50		$176 47		1,097 42	9,909 91	775
Chestnut	8,599 03	181 96		8,780 99	152 79	24 33	22 80	2,473 13	24 46		41 42	48 80	$ 19 95		$ 27 79	2,835 47	11,616 46	2,877
State St	8,599 03	133 70		8,732 93	96 14	22 01	188 05		93 11		320 81	23 55	4 00			747 67	9,480 40	2,853
Sixth Ave	8,599 03	141 52		8,740 55	39 23	44 57	8 00				55 06			807 71	6 36	1,060 87	9,801 42	100
Clinton St	8,599 03	132 64		8,731 67	135 92	11 32	20 80				440 37		6 90	767 94	8 58	1,391 83	10,123 50	1,038
Becher St	8,561 06	118 72		8,679 78	299 56		36 40		16 65		16 30		9 60	206 40		584 91	9,264 69	228
Lincoln Ave	8,599 03	123 13		8,722 16	130 89	20 62	66 96		63 20		43 11	8 80		321 72		655 30	9,377 46	32
TOTAL	$68,754 27	$1,167 73		$69,922 00	$1,032 93	$163 95	$576 16	$2,985 11	$252 40		$1,010 45	$202 11	$ 40 45	$2,340 24	$ 42 73	$8,646 53	$78,568 53	8,332

Cement Top of Center Pier and Install New Steel for Machinery—Becher St Bridge	$2,064 37	
Install New Motor—Becher St Bridge	834 06	
Install New Motor—Lincoln Ave. Bridge	430 06	
Install New Motor—Cherry St Bridge	406 34	
Install New Motor—Pleasant St Bridge	419 54	
Install New Motor—Sixth Ave Bridge	423 19	
Repairs for 4 Damages by Boat—Cherry St Bridge	149 81	
Repairs for 1-Damage by Boat—State St. Bridge	5 73	
Repairs for 1-Damage by Boat—Clinton St Bridge	26 10	
Repairs for 1-Damage by Boat—Pleasant St Bridge	26 20	4,785 40
		$83,353 93

TABLE No. 4

SHOWING COST OF OPERATING, REPAIRING AND MAINTAINING STATIONARY BRIDGES AND VIADUCTS

	OPERATION				REPAIRS											
	Labor	Supplies	Miscellaneous	Total	Electrical Lighting	House Repairs	Roadway Repairs	Resurfacing Roadways	Sidewalk Repairs	Sidewalks Replaced	Substructure Repairs	Superstructure Repairs	Painting	Miscellaneous	Total Repairs	Grand Total
Folsom St Bridge	$1,505 15	$ 1 03		$1,506 18			$ 172 32		$1,680 86	$1,584 46		$ 17 36			$ 1,855 00	$ 3,361 18
North Ave Bridge	584 67	9 95		591 62			201 53								201 53	793 15
Racine St Bridge	585 77			585 77			53 40								$17 60	71 00	656 77
Humboldt-Commerce	434 01			434 01						480 94						480 94	914 95
Canal							35 69									35 69	35 69
Holton St Viaduct		3 03		3 03			103 76		5 10		$ 3 06	537 62	169 41	2 40	821 35	824 38
Sixth St Viaduct	3,165 00	15 75		3,180 75	$0 45		156 28	$2,512 24	226 00			14 80			2,909 77	6,090 52
Sixteenth St Viaduct	2,857 58	23 63		2,881 21		$220 28	1,071 71	5,033 74	184 15	703 50	1 35	904 51	1,331 72		9,450 96	12,332 17
27th St Viaduct	1,471 46	92 97		1,564 43		1 12	2,274 03		41 25		292 36	83 20	826 22		3,518 18	5,082 61
Highland Blvd									6 80					46 14	52 94	52 94
TOTAL	$10,600 64	$146 36		$10,747 00	$0 45	$221 40	$4,068 72	$7,545 98	$2,144 16	$2,768 90	$296 77	$1,557 49	$2,327 35	$66 14	$19,397 36	$30,144 36

Floor System—Racine St Bridge	$6,104 26	
Repairs for Damage by Rd. Co. to 16th St. Viaduct	596 60	
Repairs for Damage by Auto—Folsom St Viaduct	18 54	6,719 40
		$36,863 76

TABLE No. 5

SHOWING COST OF MAINTAINING RAILROAD BRIDGES OVER C. & N. W. RY. CO.'S TRACKS

	Labor	Lamps, Material, Etc.	Power	Total
Prospect Ave.	$ 1.85	$0.55	$39.84	$42.24
Oakland Ave.	1.11	1.10	39.84	42.05
North Ave.	4.44	2.75	39.84	47.03
Bartlett Ave.	1.11	1.10	39.84	42.05
Farwell Ave.	1.48	.....	39.84	41.32
Bradford Street	5.18	3.32	39.84	48.34
Belleview Place	6.57	.55	39.84	46.96
TOTAL	$21.74	$9.37	$278.88	$308.88

TABLE No. 6

CITY HALL COSTS

	Total	Unit of Measure	No. Units	Unit Cost
Heat (less Amount furnished to Municipal Garage)	$ 7,812.52	Square Feet Radiation Surface	26,000	0.3004
Electricity (Switch Board Cost)	17,873.37	K. W. Hours	355,632	0.0503
Elevators	34,404.15	Elevator Miles	29,125	1.1812
Cleaning and Caretaking	36,741.40	Square Feet of Office Space	100,250	0.3665
Electric Lighting—Maintenance	5,146.38			
Plumbing System	579.92			
Telephone	8,534.23			
General Operation	4,242.83			
Miscellaneous Repairs	2,135.84			
Painting, Changing Wiring, etc.	2,511.89			
Installing Automatic Stokers	2,100.00			
TOTAL	$122,082.53	Square Feet of Office Space	100,250	1.218

TABLE No. 7

RECORD OF CARS IN MUNICIPAL GARAGE

Make of Car	Assigned to	Cost of Operation	Cost of Repairs	Share of Garage Costs	Total Cost	Gallons Gas. Used	Quarts Oil Used	Miles Run	Average Cost Per Mile	Miles Run on 1 Gal. Gas.	Revenue Earned
1—Ford Roadster	Meter Division	$225.23	$ 84.62	$ 94.64	$ 404.49	468	22	6,107	.066	13.1	$ 689.91
2—Ford Touring	Illumination	436.22	154.52	196.68	787.42	981½	168	10,496	.074	10.6	1,233.13
3—Ford Roadster	St. Sanitation	268.88	84.37	119.47	472.72	526	50½	6,390	.074	12.1	732.40
4—Ford Roadster	Water—Meter Div.	233.60	128.39	151.14	513.13	635	85	6,483	.079	10.2	712.69
5—Ford Touring	Illumination	423.02	221.34	261.29	905.65	812	193½	9,886	.091	12.1	1,121.07
6—Ford Touring	Illumination	472.41	276.20	255.30	1,003.91	929	302½	9,774	.102	10.5	1,117.73
7—Ford Touring	City Engineer	244.06	189.84	207.98	641.88	404	66½	5,389	.119	13.3	706.21
8—Ford Roadster	Illumination	796.51	336.03	288.85	1,421.39	1,524	361	19,857	.071	13.0	2,054.64
9—Ford Roadster	St. Construction	127.43	92.06	58.16	277.65	303	64	5,044	.055	16.6	625.93
10—Ford Lt. Delivery	Water—Distribution	382.15	361.30	312.71	1,056.10	738	111½	8,077	.131	10.9	1,124.26
11—Ford Lt. Delivery	Water—Meter Div.	261.47	84.13	122.73	468.33	536	62½	5,968	.078	11.1	866.32
13—Ford Lt. Delivery	Water—Meter Div.	393.92	155.24	203.81	752.97	720	133	7,338	.102	10.2	1,022.12
14—Ford Touring	Health	330.88	245.22	279.68	855.78	607	145	8,140	.105	13.4	911.28
15—Ford Lt. Delivery	St. Construction	268.09	177.05	195.42	640.56	498	112	5,204	.123	10.4	712.85
16—Ford Roadster	Engineers Ex'rs	118.49	128.33	139.40	386.22	219	27	2,310	.167	10.5	279.88
17—Ford Touring	Health	460.80	144.72	147.53	753.05	772	118½	10,635	.071	13.7	1,172.36
18—Ford 1-Ton Truck	Water—Distribution	243.31	166.01	230.16	639.48	546	154½	3,463	.184	6.3	539.22
23—Ford 1-Ton Truck	Illumination	424.51	253.58	141.57	819.66	1,034	286½	7,200	.113	6.9	1,060.18
24—Ford 1-Ton Truck	Water—Meter Div.	297.38	183.08	189.47	579.93	479	95½	3,728	.155	7.7	586.65
25—Ford Lt. Delivery	Water—Meter Div.	255.00	132.88	135.76	523.64	564	84	5,627	.093	9.9	782.58
26—Ford 1-Ton Truck	Illumination	420 93	219.96	268.17	909.06	1,115	288½	6,583	.138	5.9	1,033.01
27—Ford 1-Ton Truck	Garage	134.01	180.92	202.39	517.32	224	59	1,049	.493	4.7	179.29
28—Ford Lt. Delivery	Health	339.08	163.26	163.85	666.19	650	123	9,243	.072	14.2	1,185.29
29—Ford Roadster	Illumination	292.31	233.40	177.32	703.03	552	78	7,905	.088	14.3	854.60
30—Ford Touring	Land Com.	267.43	159.60	157.61	584.64	474	75	6,014	.097	12.7	706.17

TABLE No. 7

RECORD OF CARS IN MUNICIPAL GARAGE—Continued

Make of Car	Assigned to	Cost of Operation	Cost of Repairs	Share of Garage Costs	Total Cost	Gallons Gas. Used	Quarts Oil Used	Miles Run	Average Cost Per Mile	Miles Run on 1 Gal. Gas.	Revenue Earned
31—Ford Touring	Sealer of W. & M.	188.09	114.47	147.83	450.39	419	58	3,924	.114	9.3	522.44
32—Overland Touring	City Engineer	214.40	111.01	196.59	522.00	345	33½	3,974	.131	11.5	502.60
33—Ford Touring	Garage	282.66	125.17	253.22	661.05	511½	77	6,072	.108	11.8	679.04
34—Ford 1-Ton Truck	Illumination	545.99	282.03	283.67	1,111.69	1,101	284	6,862	.162	6.2	1,052.19
35—Ford 1-Ton Truck	Water—Meter Div	332.77	226.42	262.66	821.85	626	166½	3,996	.205	6.4	689.55
36—Ford Touring	Sealer of W. & M.	265.13	85.92	118.13	469.18	466	50	4,372	.107	9.4	574.67
37—2-Ton Kissel Truck	Water—Distribution	188.16	149.70	59.35	397.21	470	38	2,479	.160	5.4	447.84
38—Stegeman Truck	Water—Distribution	364.27	320.97	273.44	958.68	613	106	4,285	.223	6.9	749.29
39—Diam. T 2-Ton Truck	Water—Distribution	338.19	51.22	62.29	451.70	945	54	3,632	.124	3.8	730.29
40—Ford Touring	City Engineer	171.94	68 25	96.58	336.77	283	28	4,044	.084	14.3	565.16
41—Ford Touring	City Engineer	287.18	135.37	176.27	598.82	486½	44	5,606	.106	11.5	725.74
42—Ford Touring	City Engineer	286.77	84.65	101.70	473.12	403	21	5,007	.094	12.4	665.39
43—Ford Touring	Health Dept.	390.56	74.25	66.20	531.01	702	53	7,155	.074	10.2	861.15
44—Chandler Touring	Garage	394.12	326.18	357.62	1,079.92	485	43	4,597	.235	9.4	633.32
45—Diam. T 2-Ton Truck	Illumination	215.17	68.17	75.32	358.66	492	24	2,384	.150	4.8	444.75
46—Diam. T 2-Ton Truck	Store House	305.95	113.02	56.19	475.16	838	95½	4,192	.113	5.0	701.64
47—Mitchell Roadster	Garage	118.87	100.22	87.29	306.38	125	13	274	1.117	2.2	32.88
48—Diam. T 2-Ton Truck	Illumination	404.96	80.34	56.72	542.02	1,094	161½	4,514	.120	4.1	871.36
49—Diam. T 2-Ton Truck	Sealer of W. & M.	646.10	110.46	170.92	927.48	1,615	243	7,571	.122	4.6	1,276.01
50—Dodge Touring	Garage	581.30	190.95	362.75	1,135.00	691	183½	9,548	.118	13.8	1,131.56
51—Dodge Touring	City Treasurer	329.68	202.01	259.64	791.33	560	46	5,776	.137	10.3	776.82
52—Dodge Roadster	St. Sanitation	376.36	102.86	166.79	646.01	792	96	9,327	.069	11.8	1,157.50
53—Dodge Touring	St. Construction	429.82	239.99	286.80	956.61	513	46	7,663	.124	14.9	979.10
54—Maxwell Touring	Garage	174.33	112.04	96.01	382.38	356	29½	3,437	.111	9.6	381.73
55—Dodge Roadster	St. Construction	550.44	158.59	226.10	935.13	804	109½	11,237	.083	13.9	1,344.50

TABLE No. 7

RECORD OF CARS IN MUNICIPAL GARAGE—Continued

Make of Car	Assigned to	Cost of Operation	Cost of	Share of Garage Costs	Total Cost	Gallons Gas. Used	Quarts Oil Used	Miles Run	Average Cost Per Mile	Miles Run on 1 Gal. Gas.	Revenue Earned
56—Dodge Roadster	Bridges and Buildings	135.65	44.10	87.79	267.54	264	37	3,888	.069	14.7	491.49
57—Dodge Roadster	Water	148.09	70.29	75.72	294.10	367	49	4,435	.066	12.1	590.84
58—Maxwell Roadster	Water—Meter Div	424.27	352.57	315.00	1,091.84	834	101	8,911	.122	10.7	1,076.96
59—Dodge Touring	Illumination	144.70	235.53	77.28	457.51	248	16	3,052	.149	12.1	406.40
60—Elec. Tower Wagon	Illumination	55.90	21.84	5.30	83.04	...	...	2,351	.031	....	203.61
61—Mack 1½-Ton Truck	Illumination	76.89	6.61	.....	83.50	211	14	982	....	4.6	180.03
62—Ford Coupe	Fire & Police Alarm	211.38	20.37	15.34	247.09	578	35	7,331	.034	12.7	808.34
65—Motorcycle	Health Dept.—Garage	6.23	18.12	9.83	34.18	2	...	40	.854	20.	1.85
TOTALS		$17,613.44	$8,959.74	$9,587.43	$36,162.61	34,550½	5,622	340,828	....	...	$44,265.81

TABLE No. 8

MUNICIPAL GARAGE

Cost of New Cars	$12,423.1
Cost of New Equipment, Tools, etc.	2,054.6
Cost of Operating Garage	10,408.2
Cost of Operating and Maintaining Cars	26,573.1
Repairs to Garage	170.8
Cost of Heating 2,950 sq. ft. of Radiation (Furnished by City Hall Power Plant at .3004)	886.1
	$52,516.3
Total mileage for all cars under garage management	340,82
Amount Billed to Various Departments for use of Cars and Chauffeurs	$42,741.3

TABLE No. 9

CENTER STREET NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost Per Bather
January	$468.66	$357.42	.....	$ 30.00	$ 856.08	$115.10	$740.98	2,685	364	3,049	.245
February	437.10	377.81	.....	31.50	846.41	127.55	718.86	2,896	433	3,329	.214
March	459.38	331.07	.....	45.85	836.30	159.20	677.10	3,690	707	4,397	.154
April	487.58	276.77	.....	62.79	827.14	179.90	647.24	3,878	914	4,792	.135
May	458.10	235.10	.....	84.07	777.27	266.65	510.62	6,246	1,642	7,888	.065
June	528.25	235.30	$ 0.35	111.44	875.34	284.20	591.14	7,838	4,508	12,346	.048
July	696.03	467.87	34.39	91.07	1,289.36	314.55	974.81	9,330	4,399	13,729	.071
August	390.10	310.10	.....	102.06	802.26	283.90	518.36	9,609	4,603	14,212	.364
September	454.26	198.00	3.50	120.82	776.58	305.45	471.13	9,281	3,187	12,468	.377
October	618.35	442.87	5.75	84.28	1,151.25	292.95	858.50	7,495	2,856	10,351	.833
November	471.14	439.50	.....	60.76	971.40	188.90	782.50	4,303	1,292	5,595	.140
December	472.17	386.80	.....	64.06	923.03	176.75	746.28	3,712	1,327	5,039	.148
TOTAL	$5,941.12	$4,058.61	$43.99	$888.70	$10,932.42	$2,694.90	$8,237.52	70,963	26,232	97,195	.0847

TABLE No. 10

NORTH AVENUE NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost Per Bather
January	$558.46	$399.75	.....	$ 29.50	$ 987.71	$101.10	$886.61	3,256	480	3,736	.237
February	508.83	362.96	$3.10	27.05	901.94	106.75	795.19	3,491	596	4,087	.194
March	535.20	415.05	.....	40.90	991.15	137.60	853.55	3,855	923	4,778	.206
April	518.69	320.41	.....	57.89	896.99	165.00	731.99	4,779	1,169	5,948	.123
May	536.03	409.71	5.00	86.52	1,037.26	266.65	770.61	7,319	2,262	9,581	.081
June	649.31	313.98	.....	122.92	1,086.21	309.00	777.21	8,946	4,137	13,083	.0554
July	779.40	434.97	.....	114.52	1,328.89	350.20	978.69	12,503	5,563	18,066	.0540
August	479.44	326.50	.....	106.33	912.27	316.60	595.67	12,907	5,022	17,929	.0344
September	464.03	346.32	.....	118.02	928.37	296.15	632.22	8,511	3,393	11,904	.0530
October	676.75	516.80	.....	90.72	1,284.27	288.45	995.82	7,701	2,487	10,188	.0975
November	678.67	590.83	.....	63.00	1,332.50	161.30	1,171.20	3,909	1,101	5,010	.233
December	739.87	360.32	.....	47.18	1,147.37	152.20	995.17	3,768	888	4,656	.217
Amount Charged to Library Board Heating Branch Library						769.83					
TOTAL	$7,124.68	$4,797.60	$8.10	$904.55	$12,834.93	$3,420.83	$9,414.10	80,945	28,021	108.966	.0864

TABLE No. 11

PRAIRIE STREET NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost Per Bather
January	$504.82	$466.26	.....	$ 35.55	$1,006.63	$147.40	$859.23	3,163	770	3,933	.218
February	450.29	303.22	13.20	33.65	800.36	164.20	636.16	3,195	849	4,044	.157
March	475.60	425.95	.....	46.20	947.75	185.80	761.95	3,485	856	4,341	.175
April	469.83	357.79	.....	66.08	893.70	228.75	664.95	4,442	1,183	5,625	.118
May	471.28	369.22	.50	93.38	934.38	364.10	570.28	6,672	1,485	8,157	.071
June	1,026.86	374.10	.....	139.79	1,540.75	442.90	1,097.85	8,817	2,566	11,383	.096
July	716.67	622.70	.15	128.66	1,468.18	516.75	951.43	12,600	3,611	16,211	.058
August	475.78	471.93	.....	113.12	1,060.83	441.45	619.38	12,207	3,289	15,496	.040
September	420.57	360.29	.....	128.24	909.10	391.90	517.20	8,193	2,300	10,493	.049
October	471.68	556.05	357.45	76.09	1,461.27	335.55	1,125.72	6,359	1,371	7,730	.145
November	500.97	721.10	.....	50.19	1,272.26	195.70	1,076.56	3,541	735	4,276	.252
December	540.29	604.15	.....	52.43	1,196.87	175.55	1,021.32	3,129	843	3,972	.257
TOTAL	$6,524.64	$5,632.76	$371.30	$963.38	$13,492.08	$3,590.05	$9,902.03	75,803	19,858	95,661	.1034

TABLE No. 12

GREENBUSH STREET NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost Per Bather
January	$416.08	$293.03	.....	$ 36.55	$745.66	$162.80	$582.86	3,552	429	3,981	.1460
February	403.92	280.22	.....	38.85	722.99	174.15	548.84	3,006	1,683	4,689	.1170
March	409.43	357.19	.....	47.25	813.87	191.45	622.42	4,058	618	4,676	.1330
April	448.95	329.26	.....	69.10	847.31	263.35	583.96	5,273	981	6,254	.0932
May	441.54	267.33	.....	89.53	798.40	374.50	423.90	7,285	2,012	9,297	.0455
June	550.43	356.29	$ 2.25	136.78	1,045.75	474.55	571.20	10,923	3,371	14,294	.0399
July	573.87	485.87	.....	106.47	1,166.21	533.35	632.86	14,393	5,441	19,834	.0319
August	380.44	259.43	.75	28.77	669.39	123.50	545.89	3,177	670	3,847	.1419
September	458.71	272.69	3,326.05	71.68	4,129.13	382.95	3,746.18	9,289	3,206	12,495	.2998
October	370.47	517.63	563.16	32.41	1,483.67	335.75	1,147.92	8,964	2,384	11,348	.1010
November	366.09	534.88	205.30	49.07	1,155.34	206.55	948.79	4,177	851	5,028	1887
December	524.70	512.13	47.00	54.34	1,138.17	191.85	946.32	3,992	835	4,827	.1960
TOTAL	$5,344.63	$4,465.95	$4,144.51	$760.80	$14,715.89	$3,414.75	$11,301.14	78,089	22,481	100,570	.1128

TABLE No. 13

GREENFIELD AVENUE NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost Per Bather
January	$446.71	$373.23	.....	$ 27.00	$846.94	$178.55	$668.39	3,815	363	4,178	.160
February	450.10	359.03	$ 94.96	40.55	944.64	184.55	760.09	3,822	531	4,353	.175
March	505.93	378.93	.....	59.10	943.96	223.10	720.86	5,182	717	5,899	.122
April	453.44	314.34	1.80	81.94	851.52	259.25	592.27	5,611	1,190	6,801	.087
May	426.54	340.20	180.00	80.36	1,027.10	399.30	627.80	8,426	1,865	10,291	.061
June	562.39	285.09	19.00	129.50	995.98	495.50	500.48	11,805	4,912	16,717	.0299
July	717.25	504.29	.....	115.22	1,336.76	582.25	754.51	14,811	7,233	22,044	.0341
August	555.86	431.55	.....	142.03	1,129.44	517.40	612.04	13,886	6,543	20,429	.0252
September	426.71	292.40	.....	169.68	888.79	471.65	417.14	12,541	3,091	15,632	.0266
October	418.87	471.32	.....	120.95	1,011.14	403.75	607.39	8,896	2,547	11,443	.053
November	487.57	283.05	.....	79.44	850.06	229.35	620.71	4,968	676	5,644	.111
December	461.95	498.75	.....	61.81	1,022.51	205.95	816.56	4,326	674	5,000	.163
TOTAL	$5,913.32	$4,532.18	$295.76	$1,107.58	$11,848.84	$4,150.60	$7,698.24	98,089	30,342	128,431	.0599

TABLE No. 14

JACKSON STREET NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Amt. Chargeable to School Bd.	Net	Attendance Male	Attendance Female	Attendance Total	Cost Per Bather
January	$507.31	$899.73	$ 3.93	$ 34.85	$ 1,445.82	$ 98.65	$ 359.89	$ 987.28	5,842	3,051	8,893	.111
February	469.46	808.15	32.41	31.40	1,341.42	97.55	323.26	920.61	5,397	2,823	8,220	.112
March	518.56	801.07	21.35	34.20	1,375.18	105.35	320.43	949.40	2,264	970	3,234	.292
April	575.33	760.76	.....	47.42	1,383.51	122.55	304.30	956.66	6,304	2,733	9,037	.106
May	529.60	560.62	20.91	87.43	1,198.56	193.65	224.25	780.66	7,764	3,202	10,966	.072
June	601.35	435.29	49.42	87.36	1,173.42	231.60	174.12	767.70	7,684	3,878	11,562	.066
July	676.04	826.55	65.95	125.11	1,693.65	278.95	330.62	1,084.08	9,099	4,018	13,117	082
August	456.08	890.21	.....	68.32	1,414.61	227.65	356.08	830.88	7,591	3,995	11,586	.072
September	419.57	685.22	.....	142.38	1,247.17	226.00	274.09	747.08	7,037	2,823	9,860	075
October	508.32	821.06	.....	78.61	1,407.99	196.75	328.42	882.82	6,816	3,014	9,830	.090
November	533.63	1,123.38	27.43	48.93	1,733.37	112.50	449.35	1,171.52	3,805	2,326	6,131	.191
December	445.01	1,143.39	805.70	48.93	2,443.03	141.55	457.36	1,844.12	4,525	2,572	7,097	.260
TOTAL	$6,240.26	$9,755.43	$1,027.10	$834.94	$17,857.73	$2,032.75	$3,902.17	$11,922.81	74,128	35,405	109,533	.1088

TABLE No. 15

FIFTH AVENUE NATATORIUM

	General Operation	Heat	Repairs	Laundry	Gross	Receipts	Net	Attendance Male	Attendance Female	Attendance Total	Cost Per Bather
January	$479.52	$281.34	$ 3.80	$ 28.35	$793.01	$139.40	$653.61	3,347	1,051	4,398	.148
February	483.02	301.67	3.10	40.25	828.04	144.90	683.14	3,532	1,116	4,648	.146
March	540.99	361.63	6.00	52.40	961.02	170.05	790.97	4,015	1,502	5,517	143
April	482.57	302.21	23.01	77.30	885.09	221.70	663.39	4,382	1,265	5,647	.117
May	461.98	348.29	11.47	104.02	925.76	321.15	604.61	5,730	1,555	7,285	.044
June	774.36	223.47	14.24	134.54	1,146.61	442.80	703.81	7,981	3,426	11,407	.062
July	836.89	575.22	51.24	144.27	1,607.62	513.80	1,093.82	11,993	5,393	17,386	.063
August	826.40	529.28	.....	119.14	1,474.82	472.50	1,002.32	12,390	4,690	17,080	.059
September	418.53	173.25	36.62	167.83	796.23	386.95	409.28	8,216	2,204	10,420	.039
October	646.92	727.25	.....	73.05	1,447.22	318.25	1,128.97	6,281	1,404	7,685	.147
November	446.05	455.20	19.13	50.33	970.71	188.85	781.86	3,333	723	4,056	.193
December	564.72	525.05	.....	51.80	1,141.57	182.75	958.82	3,348	772	4,120	.238
TOTAL	$6,961.95	$4,803.86	$168.61	$1,043.28	$12,977.70	$3,503.10	$9,474.60	74,548	25,101	99,649	.0950

TABLE No. 16

McKINLEY

	Operation	Maint. and Repairs	Gross	Receipts	Net	Total Attendance	Cost Per Bather
January	$ 240.36	.....	$ 240.36	.....	$ 240.36	.....	.....
February	227.36	.....	227.36	.....	227.36	.....	.....
March	247.05	.....	247.05	.....	247.05	.....	.....
April	267.22	.....	267.22	.....	267.22	.....	.....
May	335.26	$ 69.02	404.28	.....	404.28	.....	.....
June	1,485.20	100.02	1,585.22	$198.80	1,386.42	7,967	.175
July	1,977.81	50.91	2,028.72	270.95	1,757.77	15,164	.11[illegible]
August	1,804.49	29.66	1,834.15	225.40	1,608.75	10,183	.15[illegible]
September	916.20	16.80	933.00	34.40	898.60	1,405	.06[illegible]
October	295.80	163.72	459.52	.....	459.52	.....	.....
November	244.90	24.35	269.25	.....	269.25	.....	.....
December	331.91	.....	331.91	.....	331.91	.....	.....
TOTAL	$8,373.56	$454.48	$8,828.04	$729.55	$8,098.49	34,719	.23[illegible]

TABLE No. 17

SOUTH SHORE

	Operation	Maint. and Repairs	Gross	Receipts	Net	Total Attendance	Cost Per Bather
anuary	$ 137.61	.....	$ 137.61	.....	$ 137.61	.....	.....
'ebruary	126.84	.....	126.84	.....	126.84	.....	.....
Iarch	143.48	.....	143.48	.....	143.48	.....	.....
pril	155.73	.....	155.73	.....	155.73	.....	.....
lay	147.35	$113.19	260.54	.....	260.54	.....	.....
une	1,037.01	215.88	1,252.89	$174.65	1,078.24	5,702	.189
uly	1,568.91	.....	1,568.91	256.40	1,312.51	13,358	.098
ugust	1,535.78	7.70	1,543.48	327.45	1,216.03	21,331	.058
eptember	720.39	39.50	759.89	37.50	722.39	1,681	.430
)ctober	172.91	5.75	178.66	.....	178.66	.....	.....
Jovember	126.00	.....	126.00	.....	126.00	.....	.....
)ecember	137.64	.....	137.64	.....	137.64	.....	.....
TOTAL	$6,009.65	$382.02	$6,391.67	$796.00	$5,595.67	42,072	.1340

TABLE No. 18

SUMMARY NATATORIA AND BATHING BEACHES

	General Operation	Heat	Repairs	Laundry	Gross	Rental Receipts	Other Receipts	Net	Total Attendance	Cost Per Bather
Natatoria										
Center St.	$5,941.12	$4,058.61	$ 43.99	$ 888.70	$10,932.42	$2,694.90	.....	$ 8,237.52	97,195	.0847
North Ave.	7,124.68	4,797.60	8.10	904.55	12,834.93	2,651.00	$ 769.83	9,414.10	108,966	.0864
Prairie St.	6,524.64	5,632.76	371.30	963.38	13,492.08	3,590.05	.....	9,902.03	95,661	.1034
Greenbush St.	5,344.63	4,465.95	4,144.51	760.80	14,715.89	3,414.75	.....	11,301.14	100,570	.1128
Greenfield Ave.	5,913.32	4,532.18	295.76	1,107.58	11,848.84	4,150.60	.....	7,698.24	128,431	.0599
Jackson St.	6,240.26	9,755.43	1,027.10	834.94	17,857.73	2,032.75	3,902.17	11,922.81	109,532	.1088
5th Ave.	6,961.95	4,803.86	168.61	1,043.28	12,977.70	3,503.10	.....	9,474.60	99,649	.0950
Bath Houses										
Mckinley	8,373.56	.....	454.48	.....	8,828.04	729.55	.....	8,098.49	34,719	.2332
So. Shore	6,009.65	.....	382.02	.....	6,391.67	796.00	.....	5,595.67	42,072	.1340
TOTAL	$58,433.81	$38,046.39	$6,895.87	$6,503.23	$109,879.30	$23,562.70	$4,672.00	$81,644.60	816,796	

TABLE No. 19

MISCELLANEOUS COSTS

rst Ave. Comfort Station	$ 946.89
ork for Other Departments	6,576.73
ld Jobs	176.50
	$7,700.12

TABLE No. 20

SHOWING OVERHEAD EXPENSES

laries and Expense, Genera' Supervision	$ 3,075.44
laries and Expense, Field Supervision—Not chargeable elsewhere	184.45
igineering Salaries and Expense—Not chargeable elsewhere	3,080.32
laries—Central Office, Clerical	8,565.32
ntral Office Supplies and Miscellaneous Expense	963.45
able Supp ies and Expense, including Teamster Service	2,776.99
ages and Expense—Storekeeping	4,494.81
her Expenses—Not otherwise provided for, including pay for Vacation of Day Workers	2,560.37
unches	2,054.25
re of Equipment	737.48
	$28,492.88

TABLE No. 21

SUMMARY

nstruction	$354,886.57
iscule Bridges	159,511.08
ving Bridges	83,353.93
ationary Bridges and Viaducts	36,863.76
ilroad Bridges	308.99
ty Hall	122,082.53
unicipal Garage	52,516.34
thing Stations	109,879.30
iscellaneous	7,700.12
TOTAL	$927,102 62
Overhead	28,492 88
Overhead Percentage	.0308

Annual Report

OF

Bureau of Plumbing

During Year Ending
December 31, 1920

STATEMENT OF COST OF CONTRACT HOUSE DRAIN AND WATER CONNECTION INSPECTIONS AND SPECIAL HOUSE DRAIN INSPECTIONS

1920

MONTHS	Salaries Paid	Reimbursements (Less Profits) on Special Inspections	Profits on Special Inspections	Net Cost
January				
February				
March				
April	$133.00	$ 28.00	$1.60	$103.40
May	346.50	52.50	3.00	291.00
June	273.00			273.00
July	378.00			378.00
August	318.50			318.50
September	259.00	70.00	4.00	185.00
October	231.00			231.00
November	213.50			213.50
December	70.00			70.00
TOTALS	$2,222.50	$150.50	$8.60	$2,063.40
Net cost of inspection				$2,063.40

RECAPITULATION

**Gross cost of inspections		$2,222.50
Reimbursements (less profits) on special inspections	$150.50	
Profits on special inspections	8.60	
Reimbursements and profits		159.10
Net cost of inspection		$2,063.40

**City is reimbursed for all special inspections by the house drain layers for whom such inspections are made. On special inspection service, a charge of 5 cents per hour, in excess of cost, is made.

UNIVERSITY OF ILLINOIS LIBRARY
APR 23 1923

REPORT ON CONTRACT DRAINS AND WATER CONNECTIONS AND COST OF INSPECTION THEREOF IN THE FOLLOWING DESCRIBED STREETS DURING THE YEAR 1920

WEST SIDE

STREET	FROM	TO	CONTRACTOR	INSPECTOR	COST
Cawker Pl.	30th St.	RofW of C.M.&St.P. Ry	G. Zimmermann	Edw. Wettig	No Cost
Chambers St.	39th St.	41st St.	A. Kehrein	P. J. Foran	$ 14.00
Elliott Circle			Geo. Zimmermann	J. S. Savage	24.50
Franklin St.	16th St.	Teutonia Ave.	A. Kehrein	P. J. Foran	21.00
Franklin St.	20th St.	22nd St.	A. Kehrein	P. J. Foran	7.00
Herbert St.	22nd St.	24th St.	G. Zimmermann	J. S. Savage	28.00
Louis Ave.	Atkinson Ave.	Lake St.	W. T. Werner	J. S. Savage	168.00
Nash St.	17th St.	Teutonia Ave.	W. T. Werner	P. J. Foran	35.00
Richards St.	Franklin St.	Lake St.	Frank Goll	J. S. Savage	112.00
Townsend	21st St.	23rd St.	A. Kehrein	W. Nern & E. Wettig.	No Cost
Windsor Ave.	Spring Ave. (60th St.)	Elliott Circle	G. Zimmermann	J. Savage & A. Barsch.	3.50
2nd St.	Keefe Ave.	Vienna Ave.	G. Zimmermann	J. Savage	70.00
10th St.	Graham St.	Lake St.	G. Zimmermann	J. Savage	112.00
14th St.	Atkinson Ave.	Lake St.	W. T. Werner	J. Savage	49.00
15th St.	Atkinson Ave.	Lake St.	G. Zimmermann	J. Savage	14.00
15th St.	Nash St.	Atkinson Ave.	A. Kehrein	P. J. Foran	35.00
16th St.	Nash St.	Atkinson Ave.	W. T. Werner	P. J. Foran	38.50
17th St.	Nash St.	Atkinson Ave.	G. Zimmermann	J. Savage	49.00
19th St.	Franklin St.	Atkinson Ave.	W. T. Werner	P. Foran & J. Savage.	49.00
21st St.	Teutonia Ave.	N. Line of Rosemont	F. A. Goll	J. S. Savage	42.00
47th St.	Meinecke Ave.	Center St.	W. T. Werner	J. S. Savage	150.00
53rd St.	Vine St. to 5 ft. N. of	Enterprising Land	G. Zimmermann	J. S. Savage	3.50
58th St.	Pabst Ave.	Elliott Circle	G. Zimmermann	J. S. Savage	98.00
58th St.	Elliott Circle	North Ave.	G. Zimmermann	J. S. Savage	42.00
59th St.	Pabst Ave.	Elliott Circle	G. Zimmermann	J. S. Savage	35.00
59th St.	Elliott Circle	North Ave.	G. Zimmermann	J. S. Savage	105.00
				TOTAL	$1,305.50

REPORT ON CONTRACT DRAINS AND WATER CONNECTIONS AND COST OF INSPECTION THEREOF IN THE FOLLOWING DESCRIBED STREETS DURING THE YEAR 1920—Continued

EAST SIDE

STREET	FROM	TO	CONTRACTOR	INSPECTOR	COST
Marshall St.	Wisconsin St.	Michigan St.	G. Zimmermann	J. S. Savage	$17.50
				TOTAL	$17.50

SOUTH SIDE

9th Ave.	Dakota St. to Pt. 558 ft. N. of Line of Dakota.		W. T. Werner	Edw. Kuhlman	$140.00
32nd Ave.	Greenfield Ave.	Orchard St.	G. Zimmermann	J. S. Savage	7.00
American Ave.	Cleveland Ave. to N. L. of Lot 7, Blk. 4, Puluski Park		A. Kehrein	P. Foran & A. J. Starck	35.00
So. Pierce St.	15th Ave.	Layton Blvd.	G. Zimmermann	J. Savage	63.00
So. Pierce St.	To E. Curb of 27th Ave.		F. A. Goll	P. J. Foran	84.00
So. Pierce St.	Hanover St.	7th Ave.	W. T. Werner	P. J. Foran	35.00
				TOTAL	$364.00

REPORT ON CONTRACT DRAINS AND WATER CONNECTIONS AND COST OF INSPECTION THEREOF IN THE FOLLOWING DESCRIBED STREETS DURING THE YEAR 1920—Continued

PARTLY FINISHED CONTRACTS

STREET	FROM	CONTRACTOR	TO	INSPECTOR	COST
11th St.	Atkinson Ave.	Lake St.	F. A. Goll	J. Savage	$ 98.00
12th St.	Lake St.	Atkinson Ave.	F. A. Goll	J. Savage	108.50
20th St.	Teutonia Ave.	Lake St.	F. A. Goll	J. Savage	14.00
21st St.	Pease Ave. to a Pt. 11 ft. N. of N. line of Lot 86 of Blk. 2, Rosemont		A. Kehrein	P. J. Foran	52.50
Center St.	Sherman Blvd.	51st St.	G. Zimmermann	J. Savage	63.00
Melvina St.	19th St.	Teutonia Ave.	W. T. Werner	P. J. Foran	49.00
				TOTAL	$385.00

UNFINISHED CONTRACTS

21st St.	Keefe Ave.	Pease St.	Contracts let—work not started.
22nd St.	Keefe Ave.	Melvina St.	Contracts let—work not started.
Maryland Ave.	Newport Ave.	Edgewood	Contracts let—work not started.
Oakland Ave.	Folsom Pl.	Edgewood	Contracts let—work not started.
Pease St.	W. 24th St.	27th St.	Contracts let—work not started.
Sherman Blvd.	Center St.	Burleigh St.	Contracts let—work not started.

PRIVATE CONTRACTS

Bremen and Keefe Aves., The Seaman Co.		W. H. Halsey Sons	P. J. Foran	$ 80.50
124 Oregon St.		W. H. Halsey Sons	P. J. Foran	70.00
			TOTAL	$150.00
			TOTAL	$2,222.50

RECAPITULATION

	Total Inspections	Total Plumbing Rejections	Total Drain Rejections	Total Rejeections	Percentage Plumbing Rejections	Percentage Drain Rejections	Percentage Total Rejections	Average Time, Minutes, Per Inspection	Average Monthly Cost Per Inspection	Total Cost Per Month
5	987	149	15	164	.02	.066	.166	45	1.50	$1,480.15
5	902	87	24	111	.136	.09	.123	46	1.636	1,475.68
4	1456	112	40	152	.135	.063	.104	40	1.022	1,488.05
4	2276	119	68	187	.012	.053	.082	29	.659	1,498.51
1	2193	121	51	172	.118	.044	.078	30	.688	1,497.62
1	2109	167	63	230	.159	.059	.109	31	.711	1,500.10
2	2315	152	49	201	.139	.047	.094	29	.704	1,504.50
5	2095	145	56	201	.143	.052	.095	30	.718	1,505.63
4	1737	126	44	170	.015	.049	.098	29	.861	1,495.69
1	2026	151	57	208	.016	.054	.103	30	.743	1,505.57
4	1833	134	63	197	.016	.064	.107	32	.819	1,502.36
	1488	140	29	169	.016	.052	.114	41	1.005	1,496.19
..	....	.....	.....	.....	.....	.....	.....	.....	.....	.....
..	....	.....	.....	.....	.....	.....	.....	.....	.....	.....
..	....	1603	.....	.....	.....	.....	.....	.....	.....	.....
..	....	.....	559	.....	.....	.....	.....	.....	.....	.....
..	....	.....	.....	.....	.146	.....	.....	.....	.....	.....
..	....	.....	.....	.....	.....	.054	.....	.....	.....	.....
..	....	.....	.....	.....	.....	.....	.10	.....	.....	.....
..	....	.....	.....	.....	.....	.....	.....	33.	.....	.....
31	....	.....	.....	.....	.....	.....	.....	.....	.845	.....
..			2162		.....	.....	.....	.....	.....	$17,950.06

918

	.....$ 2,460.00
1	..... 2,100.00
..	....., 17,280.00
..	..... 673.00
1	....
..	.....$22,513.00

2

1920

TABLE SHOWING BOUNDARY LINES AND NUMBER OF INSPECTIONS MADE IN THE VARIOUS DIVISIONS OF THE CITY OF MILWAUKEE

Boundary Lines of Districts	Divisions	Inspectors
All that part lying East of the Milwaukee River [illegible]	EAST DIVISION	Wm. Smith
All that part bounded [illegible] Milwaukee River [illegible]	WEST DIVISION	F. J. King
All that part lying North of [illegible] St. and West of 20th St.	WEST DIVISION	Edw. Wettig
All that part lying West of 20th St. bounded on the South by [illegible] St. and on the North by Clarke St.	WEST DIVISION	A. G. Harsch
All that part lying North of Galena St. bounded on the East by the Milwaukee River and on the West by 7th St.	WEST DIVISION	L. A. Melmer
All that part lying North of [illegible] St. and bounded on the East by 7th St. and on the West by 20th St.	WEST DIVISION	W. G. Nern
All that part lying West of 11th Ave. from the Menomonee River South to [illegible] including parts of West Milwaukee, Town of Greenfield, and Town of Lake	SOUTH DIVISION	J. J. Hotsch
All that part lying [illegible] 1st and 11th Aves. from the Menomonee River South to and including a part of Town of Lake	SOUTH DIVISION	A. W. Starck
All that part lying East of 1st Ave. from the Menomonee River South to and including a part of Town of Lake	SOUTH DIVISION	F. C. Balla

Columns for each inspector: Plumbing Inspected / Drain Inspected / Plumbing Rejected / Drain Rejected / Cost Per Inspection.

EAST DIVISION — Wm. Smith; WEST DIVISION — F. J. King, Edw. Wettig

Months	Smith Plumbing Inspected	Smith Drain Inspected	Smith Plumbing Rejected	Smith Drain Rejected	Smith Cost Per Inspection	King Plumbing Inspected	King Drain Inspected	King Plumbing Rejected	King Drain Rejected	King Cost Per Inspection	Wettig Plumbing Inspected	Wettig Drain Inspected	Wettig Plumbing Rejected	Wettig Drain Rejected	Wettig Cost Per Inspection
January	112	10	[illegible]	1	1 476	76	17	21		1 757	85	13	11	3	1 289
February	104	47	9	3	1 092	66	16	15		1 981	72	30	4	2	1 617
March	139	83	18	2	755	117	41	6		1 046	82	129	9	8	782
April	157	199	16	14	48	77	61	6	1	1 191	109	265	19	4	446
May	153	141	18		575	137	114	11	5	666	106	204	12	3	532
June	165	146	22	14	542	154	70	13		745	94	198	16	6	575
July	195	179	25	4	456	144	88	18	4	728	57	123	10	2	908
August	135	103	11	5	697	113	89	16	8	836	104	236	7	7	494
September	122	113	12	2	712	123	70	20	3	866	92	167	12	3	644
October	168	216	25	5	444	155	87	27	11	696	112	191	10	9	554
November	194	189	31	9	439	83	72	16		1 071	79	117	18	7	857
December	175	108	10	8	598	134	41	19	4	956	77	62	17	1	1 187

WEST DIVISION — A. G. Harsch, L. A. Melmer, W. G. Nern

Months	Harsch Plumbing Inspected	Harsch Drain Inspected	Harsch Plumbing Rejected	Harsch Drain Rejected	Harsch Cost Per Inspection	Melmer Plumbing Inspected	Melmer Drain Inspected	Melmer Plumbing Rejected	Melmer Drain Rejected	Melmer Cost Per Inspection	Nern Plumbing Inspected	Nern Drain Inspected	Nern Plumbing Rejected	Nern Drain Rejected	Nern Cost Per Inspection
January	71	44	9	3	1 435	82	13	16	2	1 737	75	23	15		1 656
February	90	48	12	1	1 195	73	15	9	2	2 412	54	10	8		2 538
March	124	115	27	10	694	75	53	10	4	1 297	58	40	13		1 667
April	99	186	21	9	584	95	114	15	12	803	106	108	13	7	769
May	113	163	18	13	601	105	121	22	7	743	106	137	11	4	693
June	91	116	23	1	801	100	107	21	12	810	109	149	18	5	641
July	93	76	15	8	982	142	87	24	13	1 741	135	203	23	5	491
August	101	162	17	2	635	[illegible]	128	22	15	637	99	51	25	2	1 096
September	97	140	14	7	704	106	120	20	15	743	43	22	4		2 495
October	122	213	25	5	561	65	53	11	6	1 399	130	101	15	1	723
November	66	203	13	13	624	78	96	19	7	969	85	67	3	2	1 079
December	107	[illegible]	20	1	83	85	51	19	2	1 197	81	98	12		916

SOUTH DIVISION — J. J. Hotsch, A. W. Starck, F. C. Balla

Months	Hotsch Plumbing Inspected	Hotsch Drain Inspected	Hotsch Plumbing Rejected	Hotsch Drain Rejected	Hotsch Cost Per Inspection	Starck Plumbing Inspected	Starck Drain Inspected	Starck Plumbing Rejected	Starck Drain Rejected	Starck Cost Per Inspection	Balla Plumbing Inspected	Balla Drain Inspected	Balla Plumbing Rejected	Balla Drain Rejected	Balla Cost Per Inspection
January	100	20	32	1	1 367	88	18	12	1	1 556	71	79	13	4	1 499
February	74	29	14	1	1 582	52	26	7	3	2 096	71	45	9	12	1 424
March	96	71	17	7	985	64	63	5	4	1 30	69	37	7	5	1 556
April	138	141	11	11	60	115	117	8	3	719	104	87	10	7	869
May	141	127	6		621	99	67	5	6	1 00	72	[illegible]	10	10	1 006
June	146	106	30	6	661	60	50	6	2	1 481	127	121	18	14	677
July	109	98	12		802	111	58	10	2	982	102	135	15	11	708
August	45	50	7	3	1 716	143	141	14	11	593	133	123	26	3	663
September	82	78	17	3	1 029	120	112	14	6	719	67	63	13	5	1 269
October	51	44	13	6	1 718	73	39	5	2	1 482	94	112	20	12	82
November	109	99	18	13	798	70	62	5	5	1 257	88	76	11	9	1 018
December	105	50	26	7	1 064	60	22	6	1	2 012	76	59	11	5	1 237

Yearly summary by inspector

	Wm. Smith	F. J. King	Edw. Wettig	A. G. Harsch	L. A. Melmer	W. G. Nern	J. J. Hotsch	A. W. Starck	F. C. Balla
Total Plumbing Inspections	1817	1379	1069	1174	1125	1075	1196	1055	1074
Total Drain Inspections	1554	766	1765	1560	961	1009	913	775	990
Total Plumbing Rejections	217	188	145	214	208	168	203	97	163
Total Drain Rejection	70	36	53	76	97	26	58	46	97
Percentage Plumbing Rejections	119	136	135	182	184	156	169	091	152
Percentage Drain Rejections	046	047	030	049	10	028	064	059	098
Percentage Total Rejections	086	104	07	11	15	093	12	078	13
Average Time Minutes Per Inspect	27 9	34 2	28 3	31 4	27 1	42 9	30 4	42 5	38 7
Average Cost Per Inspection	601	931	703	731	962	945	938	1 086	969
Total Per Year (Inspections)	3351	2145	2834	2734	2086	2084	2109	1830	2064
Total Per Year (Rejections)	287	224	198	290	305	194	261	143	260

RECAPITULATION

Months	Total Plumbing Inspections	Total Drain Inspections	Total Inspections	Total Plumbing Rejections	Total Drain Rejections	Total Rejections	Percentage Plumbing Rejections	Percentage Drain Rejections	Percentage Total Rejections	Average Time Minutes Per Inspection	Average Monthly Cost Per Inspection	Total Cost Per Month
January	[illegible]	227	987	149	15	164	02	066	166	45	1 50	$1,480 15
February	636	266	902	87	24	111	136	09	123	46	1 636	1 475 68
March	[illegible]	632	1456	112	40	152	135	063	104	40	1 022	1,488 05
April	998	1278	2276	119	68	187	012	053	082	29	659	1 498 51
May	1026	1167	2193	121	51	172	118	044	078	30	688	1,497 62
June	1046	1063	2109	167	63	230	159	059	109	31	711	1,500 10
July	1088	1017	2315	152	49	201	139	047	094	29	704	1,504 50
August	1012	1083	2095	145	56	201	143	052	095	30	718	1,505 63
September	852	885	1737	126	44	170	015	049	098	29	861	1 495 69
October	970	1056	2026	151	57	208	016	054	103	30	743	1,505 57
November	[illegible]	981	1833	134	63	197	016	064	107	32	819	1,502 36
December	900	588	1488	140	29	169	016	052	114	41	1 005	1,496 19
Total Plumbing Inspections	10964											
Total Drain Inspections		10273										
Total Plumbing Rejections				1603								
Total Drain Rejection					559							
Percentage Plumbing Rejections							146					
Percentage Drain Rejections								054				
Percentage Total Rejections									10			
Average Time Minutes Per Inspect										33		
Average Cost Per Inspection											845	
Total Per Year		21237			2162							$17,950 08

ANNUAL REPORT

of the Superintendent of

PLUMBING AND HOUSE DRAIN LAYING

Milwaukee, Jan. 28, 1921

Mr. Peter Bramen,
Commissioner of Public Works

Dear Sir:

I respectfully submit herewith the annual report of the Department of Plumbing and House Drain Laying for the year ending December 31st, 1920. The attached table shows the division of the City into nine districts and the number of men employed.

I wish to thank Miss Anna Goodsitt in appreciation for services rendered the department as stenographer during the year.

Respectfully submitted,

GEO. R. STOLZ,
Superintendent

DIVISIONS	Plans Approved	Plans Cancelled 1920	Plans Cancelled 1919	Plans Cancelled 1918	Plans disposed of by completion and cancellation 1920	1919	1918	1917	1916	1915	Unfinished Plans 1920	1919	1918	1917	1916	1915
West	2052	27	12	1	1750	299	5			..	302	34	7	4	....	...
East	421	3	.	...	346	76	1	.	....	.....	75	10				..
South	1034	7	5	.	906	234	4	3	1	...	128	10	1	1	1	1
Town Lake	26			...	26	13	..	.	....	.....						
Shorewood	106	.	1	1	59	88	3		2		47	16				
West Milwaukee	29			.	24	113		.	.	....	5	3				.
Town Greenfield	9				8		.		..	...						
Town Wauwatosa	28				22	29			...	.	5	1	1			.
TOTAL	3705	37	18	2	3141	852	13	3	3		564	74	9	5	1	1

ORGANIZATION

Superintendent of Plumbing and House Drains	$ 2,460 00
Deputy Superintendent of Plumbing and House Drains	2,100 00
Nine Field Inspectors	17,280 00
Transportation Street Car Fare	673 00
Junior Clerk Stenographer	
TOTAL	$22,513 00

Report of
City Engineer

For the Year Ending
December 31, 1920

January 22nd, 1921.

Mr. Percy Breman,
Deputy Commissioner of Public Works.

Dear Sir:

In compliance with the requirements of the City Charter, I herewith submit to you the report of the operations of the Bureau of Engineers for the year ending December 31st, 1920.

The following is the organization and employes in the Bureau of Engineers:

GENERAL OFFICE

George F. Staal	City Engineer
Edward F. Petersik	Head Clerk
Daisy Vojtik	Clerk-Stenographer

ENGINEERING DEPARTMENT

Ed. F. Leidel	Chief Engineer—Sewers

(Died Nov. 24, 1920.)

FIELD ENGINEERS

James C. Berneson	Senior Engineer—North
August F. Bussian	Asst. Civil Engineer—North
Theodore Gauger	Rodman—North
Alois Weiand	Rodman—North
Wm. F. Hunt	Senior Engineer—East
Harry Nelson	Asst. Civil Engineer—East
Wm. C. Herdina	Junior Engineer—East
Walter G. Bonawitz	Rodman—East
Fred Hornbach	Senior Engineer—South
John G. Baumgartner	Asst. Civil Engineer—South
Fred W. Banholzer	Junior Engineer—South
Willard J. Pendergast	Rodman—South
Ervin L. Knebes	Senior Engineer—West
Joseph Richter	Asst. Civil Engineer—West
Leon Glasgow	Junior Engineer—West
George Schmidt	Rodman—West

ESTIMATING DEPARTMENT

Frank Nahrath	Chief Engr. Estimator
Oscar E. R. Ludovice	Engr. Estimator
George Eigner, Jr	Engr. Estimator
Walter Kuechle	Engr. Estimator

DRAFTING DEPARTMENT

H. A. Peterman	Chief Draftsman
Gustav A. Uhlmann	Sewer Designer
Bruno P. Schaefer	Junior Draftsman
Henry W. Leenhouts	Junior Map Draftsman
Joseph iSkorra	Junior Map Draftsman
Louis Klabunde	Tracer

RIVER SURVEY

Herbert C. Schmitt	Senior Engineer
Frank A. Kaiser	Asst. Civil Engineer
Robert Baumgartner	Junior Engineer
Theodore Witteman	Rodman

TRACK ELEVATION

Frang Berger ---------- Engineeringing Draftsman

ENGINEERING DIVISION OF WATER DEPARTMENT

C. S. Gruetzmacher ---------- Civil Engr. of Design
A. H. Raetzmann ---------- Civil Engr. Construction
C. L. Eastman ---------- Senior Engr. Water-Const.
F. W. Schultz ---------- Asst. Structural Designer
Geo. W. Fels ---------- Asst. Civil Engr.
Jack Friebert ---------- Junior Draftsman

STREETS AND ALLEYS

The length of streets and alleys improved during the year 1920, are as follows.

Streets improved	6.934 miles
Streets paved	4.496 miles
Alleys paved	10.731 miles

The total cost of street and alley improvements amounted to $966,208.70, of which amount $861,014.32 was assessed against abutting property as benefits. The improvements made and the cost thereof are shown by the following statement:

STREET IMPROVEMENTS

81,598.00 cu. yds. of excavating	$ 74,862.26
17,480.90 cu. yds. of filling	16,467.32
63,085.17 sq. yds. of asphalt pavement	221,768.62
11,281.83 sq. yds. of asphalt top removed	4,115.82
9,291.28 sq. yds. of asphalt resurfacing	20,436.32
2,799.00 sq. yds. of asphalt pavement removed	3,417.71
987.56 sq. yds. of concrete pavement	2,586.42
160.02 sq. yds. of brick pavement	644.56
15,974.89 sq. yds. of bbrick pavement removed	23,962.34
3,064.84 sq. yds. of brick gutter	13,734.22
7,616.77 sq. yds. of sandstone pavement	38,842.54
31,837.50 sq. yds. of granite pavement	159,119.64
28,190.80 sq. yds. of limestone pavement removed	12,779.32
384.59 sq. yds. of brick repaving	1,922 95
87.00 sq. yds. of concrete removed	87.00
9,853.28 lin. ft. of stone curb	13,381.14
5,288.60 lin. ft. of stone curb reset	1,604.41
1,404.45 lin. ft. of stone radius curb	2,154.79
286.70 lin. ft. of stone curb removed	71.68
17,360.87 lin. ft. of cement curb and gutter	17,189.06
79.80 lin. ft. of cement gutter	63.84
544.30 lin. ft. of cement curb	493.53
17.00 lin. ft. of cement curb reset	4.25
648.64 lin. ft. of radius curb removed	97.30
47.00 lin. ft. of cement curb and gutter removed	14.10
111,085.04 sq. ft. of cement walk	26,080.75
4,505.70 sq. ft. of cement walk removed	941.37
785.84 sq. ft. of cement driveway	296.93
333.33 lin. ft. of planks removed	66.67
32.45 lin. ft. of concrete wall	48.68
107.00 lin. ft. of stone wall removed	107.00
	$657,362.54

ALLEY IMPROVEMENTS

29,636.75	cu. yds. of excavating	$ 51,207.66
2,784.50	cu. yds. of filling	3,694.73
105,957.68	sq. yds. of concrete pavement	244,268.75
4.16	sq. yds. of brick repaving	8.32
17,144.06	sq. yds. of cobblestone pavement removed	9,168.63
40.80	lin. ft. of stone curb removed	10.20
33.20	lin. ft. of stone curb reset	8.40
485.43	sq. ft. of cement walk removed	79.11
199.83	sq. ft. of cement walk	54.49
383 83	sq. yds. of old pavement removed	233.40
8.40	lin. ft. of cement curb and gutter	7.14
17.75	lin. ft. of cement gutter removed	5.33
2	trees removed	100.00
		$308,846.16

WORK DONE BY CITY CREWS

Cement walks	107,370.12	sq. ft.
Cement driveway	3,221.00	sq. ft.
Cement walk reset	420.77	sq. ft.
Cement curb	452.20	lin. ft.
Cement curb and gutter	1,315.20	lin. ft.
Cement curb reset	109.15	lin. ft.
Cement steps	68.60	sq. ft.
		$34,298.38

TOTAL $1,000,507.08

Table showing miles of the various pavements taken up and laid during the year 1920, and the total miles of paved streets at the end of the years 1919 and 1920:

Kind of Pavement	Miles taken up during 1920	Miles laid during 1920	Total Miles at end of 1919	Total Miles at end of 1920
Asphalt	0.	2.86924	137.17359	140.04283
Brick	0.89362	0 .	23.19553	22.30191
Granite Block	0.	1,26415	12.02506	13.28921
Sandstone Block	0.	0.31401	10.83400	11.14801
Creosote Wood Block	0.	0.	11.66353	11.66353
Bituminous Concrete	0.	0.	10.34565	10.34565
Cement Concrete	0.	0.04829	0.99601	1.04430
TOTAL	0.89362	4.49569	206.23337	209.83544
Macadam	0.78239	0.	225.05888	224.27649
GRAND TOTAL	1.67601	4.49569	431.29225	434.11193

MILES OF ALLEYS PAVEMENT

Total length of alleys paved during 1920	10.73085 miles
Total length of alley pavement removed during 1920	1.79052 miles
	8.94033 miles
Total length of alleys paved at the end of 1919	148.48954 miles
Total length of alleys paved at the end of 1920	157.42987 miles

At the end of the year 1920 there were 498.365 miles of streets within the City limits, of which 434.11 miles are improved and 64.255 miles are unimproved.

LENGTH OF STREETS

At the end of the year 1919, the total length of streets in the City of Milwaukee amounted to 494.43 miles.

During the year 1920 there were added:

By platting	0.605	miles
By condemnation	0.48	miles
By annexation	3.05	miles
	4.135	miles
Minus vacations	0.20	miles
Total of new streets	3.935	miles
Total at the end of 1919	494.43	miles
Total at the end of 1920	498.365	miles

WATER PIPE

Plans and profiles were made, line and grade given for laying 30,214 feet, or 5.722 miles of water pipe, of sizes ranging from six to twelve inches in diameter, as follows:

25,590	lineal feet of	6	inch pipe.
575	lineal feet of	6	inch hydrant pipe.
2,236	lineal feet of	8	inch pipe.
1,813	lineal feet of	12	inch pipe.
30,214	feet.		

A complete report of the costs of the laying of water pipe, etc., will be found in the report of the Supt. of Water Works and Water Purification.

VACATIONS AND CONDEMNATION OF LAND

Maps and descriptions of lands proposed to be condemned for highways or other purposes were made, also for the vacations of streets and alleys, as follows:

CONDEMNATIONS

	Ward
Martin Street, from East Water Street to Milwaukee River	3
Block 239, Dahlmann and Killian's Subdivision	7
50th Street, from Lisbon Ave. to Wright Street	22
49th Street, from North Ave. to Lisbon Ave	22
47th Street, from Clarke Street to Center Street	22
Clarke Street, from 47th Street to 49th Street	22
Alley running North and South, between 47th, 48th, Clarke and Center Sts.	22
Lot 5, Subdivision of 20.28 acres, etc	25
Lisbon Ave., from Pabst Ave. to the West City Limits	22
Block 5, Washington Park No. 2	21
Alley running North and South, between 22nd, 23rd, Concordia Ave. and Townsend Street	20
Lots 1, 2, 3,, 26, 27 and 28, Block 7, Cont. of Western Ave. Park	22

	Ward
Alley running North and South, between Pt. Washington Ave., 6th Street E. Lindner's Subd. and Vienna Ave	21
All alleys running North and South, between Concordia Ave., Davis Street, Louis Ave. and 17th Street	25
Alleys running North and South, between 48th, 49th, Center and Meinecke Ave.	22
49th Street, from Lisbon Ave. to Center Street	22
Concordia Ave. from 22nd Street to Hopkins Street	20
Alley running North and South, between 49th, 50th, Wright and Meinecke Ave.	22
Alleys running North and South and East and West, between 50th, 51st, Wright Streets and Lisbon Ave	22
Meinecke Ave., from 48th Street to Lisbon Ave	22
Alley running North and South, between 20th, 21st, Pease Streets and Keefe Ave.	20
Garden Street, from Lincoln Ave. to Chicago Ave	17
Lots 11, 12, 13, 14, 15 and 16, Block 164	2
51st Street, from Lisbon Ave. to Wright Street	22
Neck Street, from Ellen Street to Linebarger Terrace	17
Block 11, Irving Park	25
Grand Ave., from 11th Street to 12th Street	4
6th Ave., from Montana Street to Northerly right-of-way of Chicago & Northwestern Ry.	14
Blocks 7 ,8, 9, 10 and 11, Burnham Heights	17
Lands for park purposes between Burnham Heights, Humboldt Park, Howell Ave. and Pine Ave	17

VACATIONS

	Ward
East ½ of alley in Block 149, Huidekoper's Subdivision	12
Hadley Street, from 30th Street to Easterly Right-of-Way of C. M. & St. Paul Railway	20
Pauline Ave., from 30th Street to a point 135 feet West	20
Alley running North and South, in Block 5, Paline's Subdivision	20
Mill Street, from 3rd Street to Westerly Right-of-Way of C. M. & St. Paul Ry.	21
Abert Place, from Green Bay Ave. to 11th Street	25
All East and West alleys in Blocks 3, 4, 5, 6 and 7, Abert Heights	25

The following street name was changed during the year 1920:

Kathryn Place changed to West 50th Street ..... 19th Ward

AREA OF CITY, January 1st, 1921—26.089 square miles.

Land—25.571 square miles; Water 0.518 square miles.

The area of the city January 1st, 1900	21.15 square miles
The area of the city January 1st, 1905	22.37 square miles
The area of the city January 1st, 1910	22.63 square miles
The area of the city January 1st, 1915	25.72 square miles
The area of the city January 1st, 1916	25.85 square miles
The area of the city January 1st, 1917	25.85 square miles
The area of the city January 1st, 1918	25.85 square miles
The area of the city January 1st, 1919	25.85 square miles
The area of the city January 1st, 1920	25.85 square miles

SEWERS

Contracts for work completed during the year included 45,784 lineal feet of 8, 10, 12, 15, 18 and 21 inch cement or clay pipe sewer; 3,160 lineal feet of 24, 27, 30, 33, 36 and 42 inch reinforced concrete pipe sewers.

The Sewer Department, in addition to the flushing and cleaning of sewers, repairs to and setting to grade of manholes, built 16 manholes and 671 catch basins during the year. In addtiion to the sewers laid and accepted during the year 1920, amounting to 9.269 miles at a cost of $207,373.85, there were laid 64 lineal feet of 6 inch pipe sewer, 164 lineal feet of 8 inch pipe sewer, 2778 lineal feet of 12 inch pipe, 90 lineal feet of 18 inch pipe and 108 lineal feet of 48 inch pipe, and 202 lineal feet of 15 inch pipe sewers by the Bureau of Sewers.

Up to the end of 1919 there were built 522.889 miles of sewer at a cost of $7,769,397.90, making at the end of 1920, a total of 534.247 miles at a cost of $8,536,941.84.

The total length of sewers, including intercepting sewers, constructed by the City of Milwaukee up to the end of the year 1920, was 567.847 miles, as follows.

12.094 miles of 8 and 10 inch pipe.
193.012 miles of 12 inch pipe.
180.332 miles of 15 and 18 inch pipe.
1.767 miles of 20, 21 and 22 inch pipe.
2.325 miles of 24 inch reinforced concrete pipe.
1.042 miles of 27 inch reinforced concrete pipe.
1.927 miles of 30 inch reinforced concrete pipe.
1.797 miles of 33, 36 and 39 inch reinforced concrete pipe.
1.121 miles of 42, 45 and 48 inch reinforced concrete pipe.
0.461 miles of 54 and 60 inch reinforced concrete pipe.
14.083 miles of 24 inch brick.
42.926 miles of 30 inch brick or monolithic concrete.
19.217 miles of 36 inch brick or monolithic concrete.
9.689 miles of 42 inch brick or monolithic concrete.
8.994 miles of 48 inch brick or monolithic concrete.
5.495 miles of 54 inch brick or monolithic concrete.
6,503 miles of 60 inch brick or monolithic concrete.
4.220 miles of 66 inch brick or monolithic concrete.
7.618 miles of 72 inch brick or monolithic concrete.
2.465 miles of 78 inch brick or monolithic concrete.
2 754 miles of 84 inch brick or monolithic concrete.
0.175 miles of 90 inch brick or monolithic concrete.
3.397 miles of 96 inch brick or monolithic concrete.
2.718 miles of 120 inch brick or monolithic concrete.
33.6 miles of intercepting sewers (including intercepters built by Sewerage Commission)

The largest diameter of sewer built is 120 inch and the smallest diameter is 8 inch. There are 89 outlets for sewers into Milwaukee, Menomonee and Kinnickinnic rivers and four outlets into Lake Michigan. These sewers have 24,459 manholes and 26,508 catch

basins; there are also 80,698 house drains connected with the sewers and 1,254 storm drains. All work completed during the year, including laying of sewers, water pipe, house drains and water service, has been entered on the proper departmental records.

ESTIMATING DEPARTMENT

Prepared estimates for improving streets and alleys	375
Prepared ordinances for establishing grades on alleys	106
Prepared ordinances for establishing grades on streets	62
Prepared ordinances for establishing width of sidewalks	30
Prepared ordinances for establishing grade of sidewalks	0
Prepared profiles for establinshing grades	152
Prepared sketches and plans for street and alley improvements	642
Prepared plans for house drains and water service	60
Issued certificatees for street and alley improvements	147

STAGE OF WATER IN RIVERS AND LAKE DURING 1920

	Highest	Lowest	Mean
January	-|-1.8	-|-0.4	-|-1.168
February	-|-1.2	-|-0.5	-|-0.816
March	-|-1.5	-|-0.2	-|-0.875
April	-|-1.5	-|-0.1	-|-0.533
May	-|-2.0	0.0	-|-0.310
June	-|-2.0	0.0	-|-0.2761
July	-|-1.0	0.0	-|-0.185
August	-|-1.0	0.0	-|-0.184
September	-|-2.0	0.0	-|-0.299
October	-|-1.1	-|-0.1	-|-0.609
November	-|-0.9	—1.6	—0.292
December	-|-0.9	—2.2	—0.628

Highest	+2.0
Lowest	—2.2
Average Mean	+0.361

	Highest	Lowest	Mean
1920	-|-2.0	—2.2	-|-0.361
1919	-|-0.7	—1.9	—0.3398
1918	-|-1.3	—0.6	-|-0.173
1917	-|-3 0	—0.8	-|-0.0864
1916	-|-0.4	—1.1	—0.349
1915	0.0	—1.2	—0.6105
1914	-|-0.2	—1.5	—0.489
1913	-|-0.3	—1.5	—0.6119
1912	-|-1.7	—2.9	—0.7939
1911	—0.6	—2.9	—1.809
1910	—0.3	—2.6	—1.497
1909	-|-0.8	—3.0	—0.242
1908	—1.1	—1.5	—0.482
1907	-|-1.0	—1.1	-|-0.960
1906	-|-1.1	—0.9	-|-0.070

1905	-|-1.0	—1.2	—0.020
1904	-|-1.5	—1.36	—0.140
1903	-|-0.23	—1.73	—0.660
1902	0.0	—2.2	—1.010
1901	-|-0.4	—1.9	—1.690

LINWOOD AVENUE TUNNEL

This tunnel will connect the present Linwood Avenue Intake with the proposed Riverside Pumping Station. It will be about 7,336 feet long, of 9 foot diameter, and constructed of plain concrete. A special "Y" connection with the Short Tunnel south of the shore shaft of the intake will enable water to be supplied from either the Linwood Avenue intake or the North Point intake, as well as from the outlet of the clear water basin of the proposed filtration plant.

Herman Hohensee was awarded the contract in 1919 on his bid of $523,491.92, and started actual construction at the temporary shaft on Oakland avenue on December 27th, 1919.

Preliminary to the construction of the tunnel, all buildings along the line of the tunnel on Linwood avenue were inspected for damaged walls, and those buildings which wert found to be in a damaged state were photographed and a record kept of this inspection. This inspection was made to protect the city from possible future claims for damage to adjacent structures because of the construction of the tunnel.

A temporary shaft was started at Lake Drive and Linwood Ave. on January 26th, 1920. The tunnel at this point is 117 feet below the surface of the street. The temporary shaft at Oakland Ave. and Linwood Ave. was completed on March 4th, 1920, and the tunnel started east and west, when on March 10th, 1920, water came in at the tunnel and filled the shaft. Air locks were installed in the shaft and on account of the labor shortage, work was abandoned at this shaft on April 10th, 1920. In the meantime the shaft at Lake Drive was completed on March 14th, 1920, and tunnel was being driven both ways. All work was then confined to this shaft and air locks were installed about 100 feet each way from the work shaft. On account of heavy inflow of water from the sand and gravel seams in the tunnel, air pressure was put on in both drifts which dried the face and increased progress. The maximum advance for one month was 572 lineal feet for the two drifts. The total advance made from the Lake Drive shaft was 3,471 lineal feet connecting with the gate well at the shore shaft of the Linwood Avenue Intake and extending west 2,150 lineal feet, just east of Prospect Avenue. The east drift was completed up to the bulkhead at the west gate well on November 20th, 1920. The "Y" connection was also constructed at this point and the east end closed with a concrete bulkhead one foot thick. At the close of the year, preparations were being made to resume operations at the Oakland Avenue shaft.

The west drift from the shaft at Lake Drive has been completed to apoint 2,150 feet west of the shaft and there closed by a concrete bulkhead.

Operations are now being conducted at the Oakland Avenue work shaft and at the gate well at the Riverside Pumping Station site. The latter is being excavated. About 47 per cent of the tunnel is completed which includes the bell mouth at the east end of the tunnel. The amount of work left to be done is two gate wells and the installation of the gates and approximately 3,865 lineal feet of tunnel. This contract, it is expected, will be completed about October 1st, 1921.

RIVERSIDE PUMPING STATION

The first step toward the construction of the proposed Riverside Pumping Station on the Milwaukee River site was made this year, when a reinforced concrete retaining wall and dock was constructed along the west bank of the river.

Bids for the construction of the wall 546 feet in length were received on August 23rd, 1920, as follows:

H. Hohensee	$ 57.67	per lin. ft.	or	$31,487.82 Total
W. F. Tubesing	59.00	per lin. ft.	or	32,214.00 Total
F. W. Taddy & Co	85.00	per lin. ft.	or	46,410.00 Total
Wenzel & Henoch Co	88.80	per lin. ft.	or	48,484.80 Total
Arthur W. Riesen	156.00	per lin. ft.	or	85,176.00 Total

The contract was awarded to H. Hohensee, and excavation for the wall was begun on September 17th. The water in the river was let out by opening the gates in the dam below. Several other structures to cross and the river were started at this time, being the North Avenue Bridge and a sewer intercepter for the Sewerage Commission, all of which work was dependent upon lowering the river level.

The material excavated consisted of clay, more or less wet, and mixed with some gravel and boulders. The foundation for the wall was laid first over the entire length, joints being left every 31 feet. The forms for the upper wall were then erected and the wall built in alternate sections to a level of 7 ft. 6 in. above the average river level.

The face of the wall is paneled on the river side, the top having a 3-pipe railing with concrete posts set at 31 foot centers. Alternate posts have connections to the electric wire conduit in the wall and concrete lamp posts will be erected upon them in the near future. Because of the late start, only the wall was completed. The posts and railing will be erected during the spring of 1921.

Plans for the new Pumping Station will be prepared during 1921. The grading of the site will also be done the coming year.

FILTRATION PLANT

The operation of the Experimental Filtration Plant was discontined during February, 1920, and a report covering all the experiments made on the lake water was prepared by Mr. Jos. W. Ellms, Consulting Engineer, of Cleveland, Ohio.

In order to finance the construction of the proposed filtration plant, the Common Council late in the year 1920, passed an ordinance raising the present water rates. It is expected that the increased rates will enable the city to pay for its filtration plant within the next five years or so without restorting to the sale of bonds. The capacity of the plant will be 160,000,000 gallons daily, to be later increased to the ultimate capacity of the Linwood Avenue Intake or about 250,000,000 gallons daily. It is proposed that the plans for the work will be completed in 1921.

REED STREET WATER PIPE TUNNEL

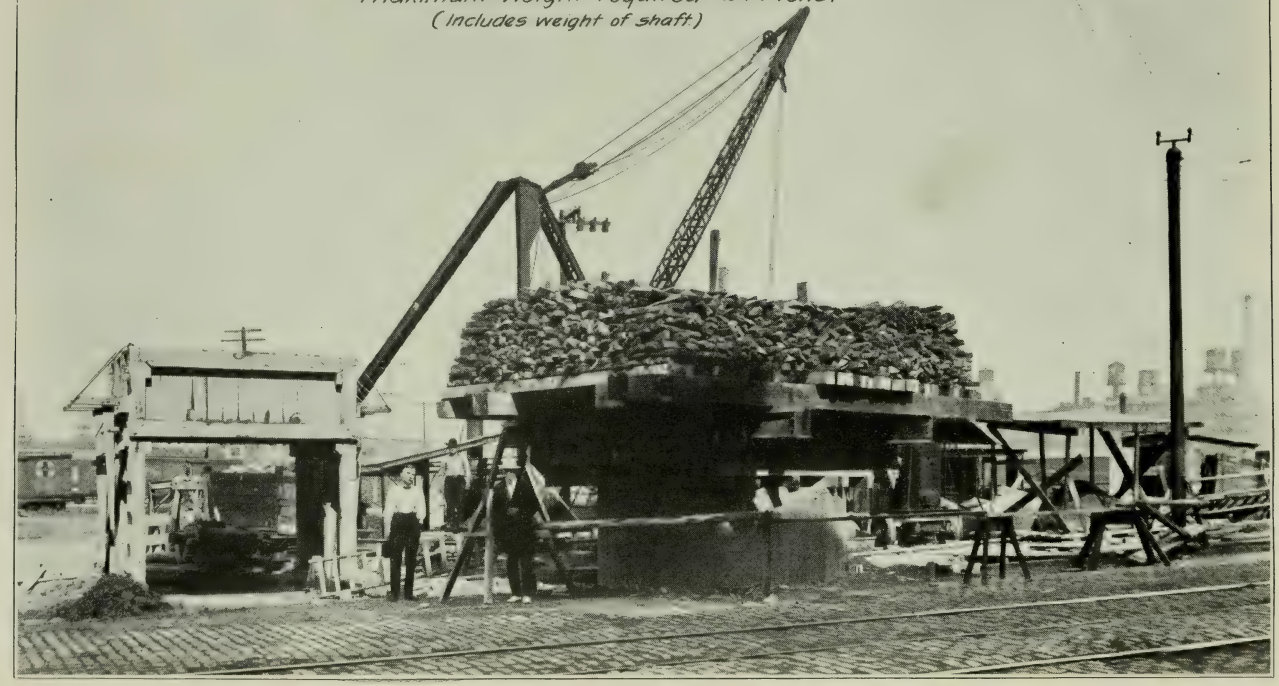
The Low Service Distribution System in the Menomonee Valley district was strengthened by the completion, on May 24th, 1920, of the sub-aqueous utnnel under the Menomonee River at West Water Street Bridge, and the connection through it of the ends of the former 20 inch low service water pipe on both sides of the river. The static pressure, south of the river, as ascertained by test on hydrants in the vicinity, has been increased five pounds per square inch as a result of freer circulation of water in this area.

The construction of the tunnel has been more fully described in last year's report. The installation of the water pipe in the tunnel and shafts was begun on January 8th, 1920. Friction losses due to four right angle bends in the shafts and tunnel have been lessened by the use of 24 inch pipe in the tunnel and shafts, the connections to the 20 inch main being made near the shafts with 24x20 inch reducers. Only bell and spigot joints are used throughout the work, all joints which are liable to draw apart, due to the water pressure, are secured by the use of lugged pipe, bolted together. At the tops of the shafts where the pipe curves cut through the wall of the shaft, a special tension plate of wrought iron is used to prevent the parting of the pipe. Provision for the vertical movement of the pipe in the shaft is made by filling in solidly with asphalt and hot pitch a 4-inch space between the pipe and the opening in the shaft. The base curves of the pipe in the shafts are embedded in solid concrete, and the curved pipes in the tunnel are also backed up with concrete to prevent their movement under pressure.

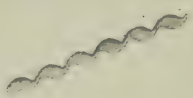
The pipe line was tested on April 13th, 1920. Water was run into it from a hydrant on the south end, the air escaping from a tapped connection on the north end. Pressure was then applied by a fire engine drawing from a hydrant nearby. The static pressure at the hydrant varied from 50 to 58 pounds. The test pressure on the pipe line was started at 100 pounds on the pipe in the tunnel and was increased in stages until the pressure reached 160 pounds on the pipe in the tunnel and 135 pounds on the pipe in the trench above. The duration of the test was about one hour. Inspection of the joints meanwhile, revealed only one small leak in a joint in the north shaft, which was subsequently recaulked.

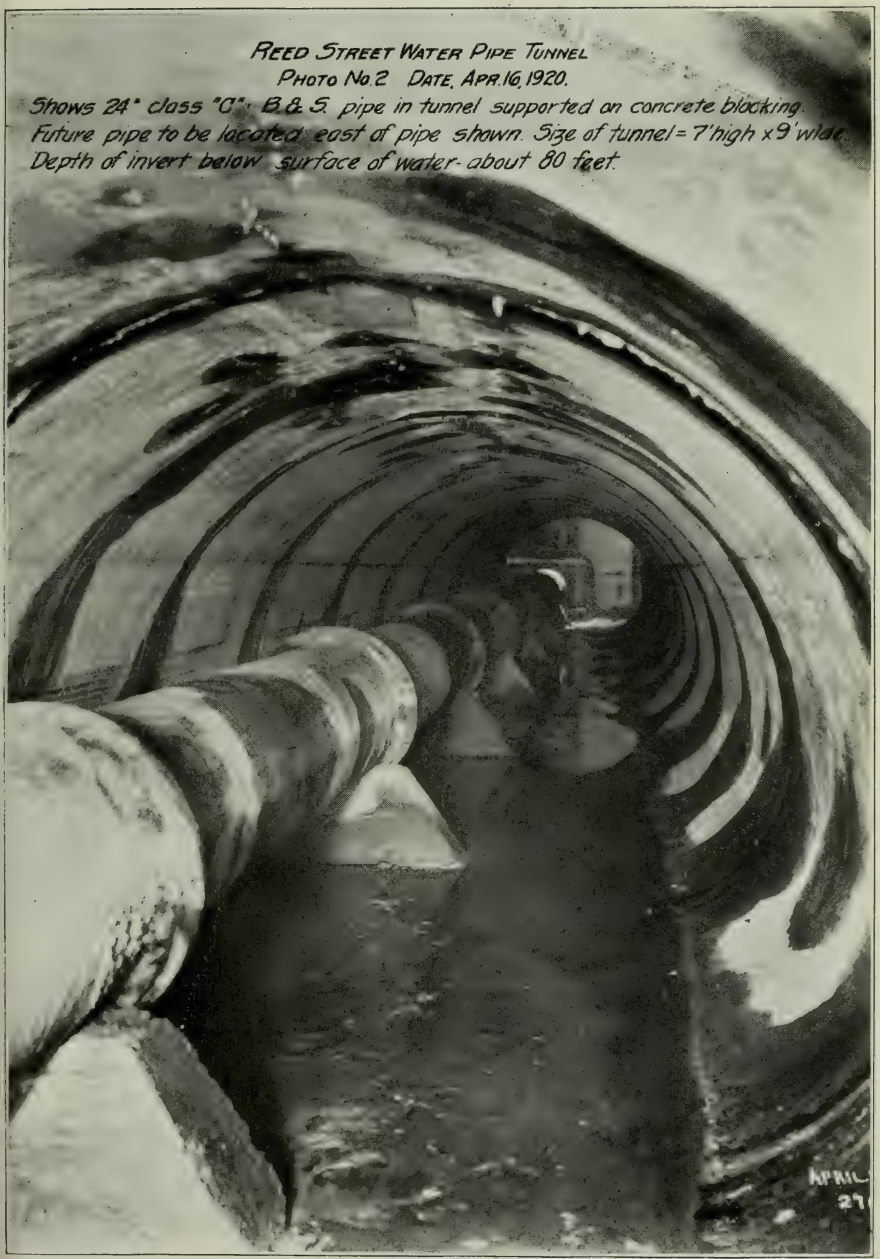
The entire work was completed on May 24th, 1920, and the water turned on after being shut off since November, 1916. This improve-

REED STREET WATER PIPE TUNNEL
PHOTO NO 1. DATE, JULY 20, 1919
Shows method of sinking south shaft.
Weight of pig iron shown: 126 tons.
Maximum weight required: 244 tons.
(Includes weight of shaft.)

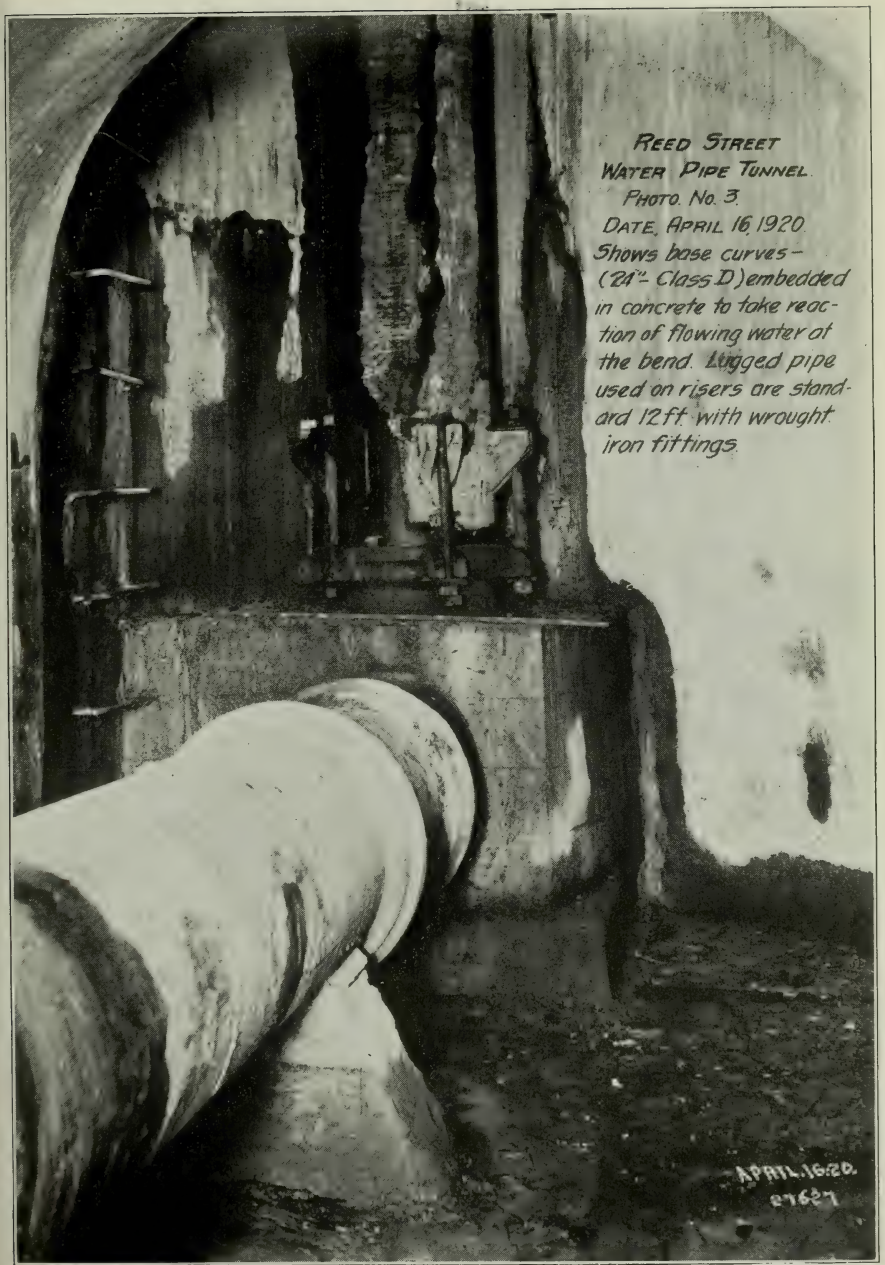


UNIVERSITY OF ILLINOIS LIBRARY



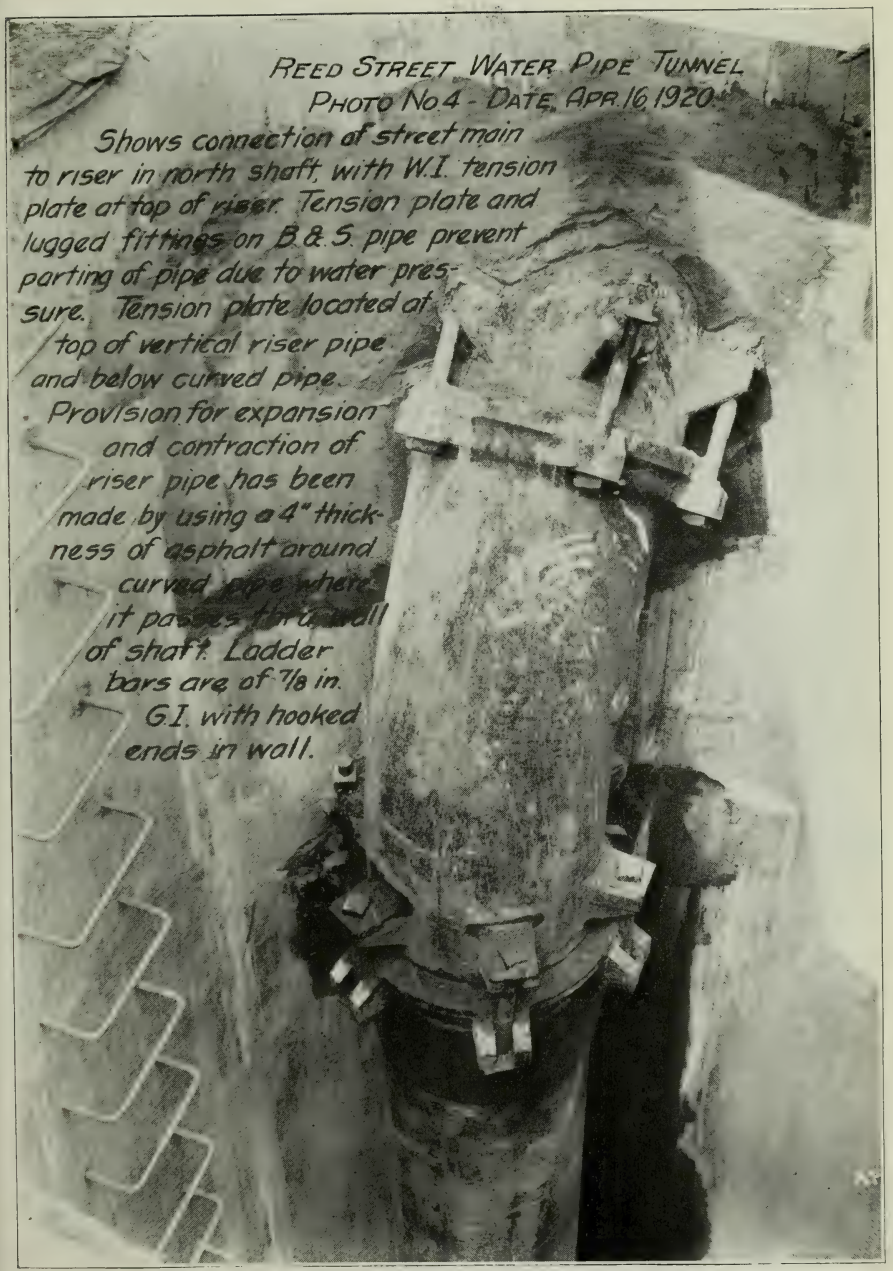

REED STREET WATER PIPE TUNNEL
PHOTO NO. 2 DATE, APR. 16, 1920.
Shows 24" class "C" B. & S. pipe in tunnel supported on concrete blocking.
Future pipe to be located east of pipe shown. Size of tunnel = 7' high x 9' wide.
Depth of invert below surface of water - about 80 feet.
APRIL
27

UNIVERSITY OF ILLINOIS LIBRARY


REED STREET
WATER PIPE TUNNEL.
PHOTO. No. 3.
DATE, APRIL 16, 1920.
Shows base curves –
(24"– Class D) embedded
in concrete to take reac-
tion of flowing water at
the bend. Lugged pipe
used on risers are stand-
ard 12 ft. with wrought
iron fittings.
APRIL.16.20.
27627

UNIVERSITY OF ILLINOIS LIBRARY




Reed Street Water Pipe Tunnel
Photo No. 4 - Date, Apr. 16, 1920.
Shows connection of street main to riser in north shaft, with W.I. tension plate at top of riser. Tension plate and lugged fittings on B.&S. pipe prevent parting of pipe due to water pressure. Tension plate located at top of vertical riser pipe and below curved pipe. Provision for expansion and contraction of riser pipe has been made by using a 4" thickness of asphalt around curved pipe where it passes thru wall of shaft. Ladder bars are of 7/8 in. G.I. with hooked ends in wall.

UNIVERSITY OF ILLINOIS LIBRARY



rent cost the city about $109,000. The accompanying photographs illustrate the method used in sinking the shafts and the general features of the tunnel and the pipe line.

MUSKEGO AVENUE WATER TUNNEL

The present 16 inch low service water main supplying the western part of the South Side crosses the Menomonee River at Muskego Avenue in a trench in the bed of the river. This main has been frequently fouled by large coal steamers passing overhead. The Sewerage Commission required a tunnel crossing at this point for their low level sewer syphon and a combined sewer and water pipe tunnel was designed to serve both purposes.

This tunnel is similar to the one at the Reed Street crossing. It is of circular cross-section, 6 ft. 6 in. internal diameter and 277 ft. long between shafts. The latter are 12 ft. in diameter and about 75 ft. in depth. The shafts are constructed of reinforced concrete, while the tunnel is of plain concrete.

The tunnel will carry a 24 inch water main, using bell and spigot pipe in the tunnel and street trenches and flanged pipe in the shafts bolted together with bronze bolts. The curved bases are embeddd in solid concrete and the shaft risers are held in position with the sewer pipe by means of horizontal steel frames extended across the shaft at intermediate points from top to bottom. The tunnel is completed and the entire pipe line installed in it. A test on the water main at a maximum pressure of 165 pounds, maintaining for one-half hour, revealed no leaky joints in the line. During the coming Spring, the main will be connected to the present 16 inch line on both sides of the river and the present main lying in the bed of the river will be abandoned.

The contractor for this work is Jas. A. Greene & Son, of Chicago, Illinois, and the contract price of the work is about $119,000, of which amount the Water Department will pay one-half as its share.

SEWERS

City sewer department work was normal as compared to other years. The usual extensions were made, closely following annexation of territory to the city. About 85% of the pipe sewers installed were built under the separate or double system of sewerage, i.e., separate lines for sanitary sewage and stor mwater, this requiring two connections from each building. Most of the extensions were made in the northwest part of the city.

No new larke trunk sewer was built this year, but such a line will have to be constructed in the near future to take care of the sewage from the new territory northwest of the city which it is believed will be annexed shortly. The main sewer in Lake Street (north city limits) has been extended to 24th Street as far west as practicable.

About forty contracts were let during the summer, these cove ing the installation of 58,000 lineal feet of pipe sewers ranging i size from 8 in. to 42 in. at a cost of $236,000.00.

RIVER SURVEY

The work of the Harbor Commission's engineering staff durin the year 1920 can be resolved into two classes namely, uncomplete work from prior years and new work.

Under "Uncompleted Work" we have completed a very accurat survey and are finishing the maps of all the waterways in the city o Milwaukee. These maps of which there are about 70, are draw up to a large scale and show all existing buildings, tracks, docks an conditions along our waterways. They are to be forwarded to th War Department of the United States and the dock lines thereon wil be definitely established relieving the city of many dock problem they had to face. The completeness of this survey can only be real ized by a study of the maps and the fact that all new bridge an dock is designed from the information on these maps.

Considerable engineering work was done on the harbor develop ment plan and on the condemnation of Jones Island, north of Wilco Street. This work will lead to the making the harbor of Milwauke the great port of the lake and cannot be gone into in detail.

Under new work in 1921, we have designed and let the contrac for a $21,600.00 bulkhead in the lake just east of Jones Island whic is the first step on the outer harbor improvement. The bulkhea consists of a pile stone filled revetment 2,200 feet long and will hol the 600,000 cu. yds. of fill which will be placed behind it in order t fill in the lake for the necessary track room for the outer harbo project. The bulkhead is about 25% complete. Lines for construc tion were given for all new docks and construction work along th rivers.

TRACK ELEVATION AND DEPRESSION

Actual construction work of track depression and elevation failed to materialize during the past year, due to the fact that certain plans remained to be approved and also a decision remained to be rendered by the Railroad Commission as to the method to be pursued in arriving in the apportionment of costs, which apportionment, however, has been made by the Railroad Commission in its final order. It appears that a very comprehensive accounting system must eb installed in order that the true cost of the grade separation work be shown. Numerous joint hearings of the officials of both railroads, the City of Milwaukee and the Railroad Comimssion, were held both in Madison and Milwaukee, and it is expected that all matters will be straightened out in a short time and actual construction work begun early in the Spring of 1921.

FINANCIAL

BUREAU OF ENGINEERING—GENERAL OFFICE

idget Appropriation	$6,212.00

EXPENDITURES

rsonal Service—Permanent	$5,657.58
fice Supplies	109.48
unicipa. Garage Service	200.00
stage	20.00
neral Service	11.30
ficial Bond	25.00
fice Equipment	31.50
TOTAL	$6,054.86
Unexpended Balance	157.14
	$6,212.00

BUREAU OF ENGINEERS—ENGINEERING DIVISION

idget Appropriation	$62,153.00

EXPENDITURES

ersonal Service—Permanent	$52,414.08
ersonal Service—Temporary	3,497.73
ffice Supplies	446.67
eneral Supplies	957.63
inor Apparatus	218.20
ools	19.59
eneral Materials	2.25
unicipal Garage Service	2,983.52
ostage	20.00
orage of Vehicles	287.00
reet Car Fare	25.00
eneral Service	306.57
ffice Equipment	100.00
TOTAL	$61,278.24
Unexpended Balance	874.76
	$62,153.00

RECAPITULATION

	Budget Appr.	Expenditures	Balance
eneral Office	$ 6,212.00	$ 6,054.86	$ 157.14
ngineering Division	62,153.00	61,278.24	874.76
	$68,365.00	$67,333.10	$1,031.90
ervice Vouchers—Engineering Division			1,082.55
			$2,114.45

I desire to express my appreciation to the employees in the De partment for their healty co-operation in the faithful discharge o their duties.

Respectfully submitted,

GEO. F. STAAL,

City Engineer

Annual Report

OF

Bureau of Power Plants Flushing Stations

For the Year

1920

FERDINAND KRIEGER,
Chief Engineer of Power Plants

February 7th, 1921.

Mr. Percy Braman,
Deputy Commissioner of Public Works.

Dear Sir:

Reports of operation of the several Power Plants for the year ending December 31st, 1920, are herewith submitted:

MILWAUKEE REFUSE INCINERATOR

Joseph E. Roddy, Supt.

During the year no power was bought from the Electrical Company to operate the Milwaukee River Flushing Plant, and the river was kept in a good condition during the summer months, without complaints of any kind. Previous to June 21st the plant was not operated, on account of the removal of the old wooden intake, and replacing same by one of concrete construction. During November, and after December 21st, the plant was but little operated, on account of the high price of coal, which exhausted the fund for coal for this purpose at the Incinerator Plant.

The coal used in the extended furnaces at the Incinerator seems to prove that the extended furnace is not the success that it was expected to be; as the amount of coal used is out of proportion to other coal fired plants, the reason for this being that these boiler furnaces were constructed to burn garbage and not coal.

It might be advisable at this Plant to extend the crane tracks at north end of building, out some distance so as to allow three or four wagons to unload at the same time. This would provide means of getting the proper mixture of ash and garbage on the ground floor and would with the use of much larger boxes reduce the number of lifts very materially and should be a saving.

TOTAL COST OF OPERATION
GARBAGE AND MIXED REFUSE INCINERATED

YEAR	Total tons mixed refuse incinerated	Total cost including equipment	Total cost of equipment	Total cost of operation only	Cost per ton
1911	$50,803.39	$57,419.47	$ 5,056.45	$53,363.02	$1.05
1912	48,413.32	56,760.51	3,580.74	53,179.77	1.10
1913	53,581.02	66,147.30	4,269.31	61,877.99	1.15
1914	54,684.15	67,892.43	1,365.48	66,526.95	1.22
1915	58,043.10	66,812.56	3,695.40	63,117.16	1.09
1916	54,275.36	67,613.10	3,374.64	64,238.46	1.1835
1917	46,979.97	75,921.82	3,842.75	72,079.07	1.534
1918	45,457.58	81,797.80	750.20	81,047.60	1.7837
1919	42,202.26	103,742.78	925.95	102,816.83	2,4362
1920	44,819 81	141,146.54	546.50	140,600.04	3,137

STATEMENT SHOWING TOTAL REFUSE INCINERATED, CITY AND PRIVATE COLLECTIONS DURING 1920, AND FEED WATER PUMPED TO BOILERS

MONTH	Total hours operated	Total pounds mixed refuse incinerated	Cubic feet of water to boilers	Temperature of water to boilers	Average pounds water per hour to boilers	Average Evap. per lb. of mixed refuse
January	664	5,860,000	67,856	180	6,190.839	.7015
February	616	5,321,220	62,344	180	6,131.169	.7098
March	680	6,440,020	73,832	180	6,577.565	.6945
April	656	6,581,260	78,158	180	7,217.701	.7194
May	664	6,156,340	84,626	180	7,720.846	.8327
June	656	7,478,060	92,302	180	8,523.864	.7477
July	672	7,920,920	113,927	180	10,270.387	.8713
August	664	8,677,520	113,194	180	10,327.248	.7902
September	656	10,307,340	114,480	180	10,571.948	.6728
October	664	9,274,040	107,428	180	9,801.248	.7017
November	640	7.766,580	71,625	180	6,779.753	.5587
December	664	7,862,320	79,868	180	7,286.751	.6154
TOTALS	7,896	89,639,620	1,059,640	180	8,117.443	.7180

Average percentage of refuse incinerated during 1920: Garbage, 76.668%; ashes, 20 367%; rubbish, 2.965%; manure, .00%.

INCINERATOR POWER PLANT—1920

Thomas Coughlin, Engineer-in Charge.

The Power Plant equipment did not call for any changes. The cessary examination and repairs to machinery were made during e early part of the year; the turbine and generator were given a at of paint, and are now, as far as known, in good condition. The wer delivered to the Milwaukee River Flushing Plant during 1920, as as follows:

MONTH	Total hours operated Flushing Station	Average K. W. operating Flushing Station	Total K .W. H. delivered to Flushing Station.
nuray			
bruary			
arch			
ril			
ay			
ne	169.30	361.4	61,440
ly	576.55	322.49	186,240
igust	550.25	326.38	179,840
ptember	563.20	322.55	181,760
tober	524.05	311.40	163,200
vember	48.15	318.34	15,360
cember	179.05	258.80	46,080
TOTALS	2,611.35	317.34	833,920

MILWAUKEE RIVER FLUSHING STATION—1920

David E. Cameron, Engineer-in-Charge.

tal hours in operation—flushing	2,620.25
tal K.W.H. delivered from Incinerator Plant	736,712
tal cubic feet of water displaced	6,616,839,183
tal gallons of water displaced	49,497,391,228
verage head of water in feet	2.876

The motor drive and other mechanical equipment was not in need any repairs, and is now in good operating condition. The boiler r heating purposes was repaired during the summer. The station ould be painted and renovated inside, in the near future, which can e done by the regular employees.

KINNICKINNIC RIVER FLUSHING STATION—1920

Ernest C. Eggebrecht, Engineer-in-Charge.

Total hours in operation	7,844.15
Total cubic feet of water displaced	11,946,016,400
Total gallons of water displaced	89,362,402,654
Average head of water in feet	2.18
Total coal consumed in pounds	2,665,450

In the early part of the year the wheel pit was pumped out, and wheel and bearings examined, and all was found in good condition excepting the wheel, most blades are cracked and patched, and a few pieces gone entirely; this should certainly be repaired and looked after, but before doing this it would be most advisable to make some extensive repairs to the intake at the lake end of tunnel. The timbers, piles protecting platforms, now wood, are in a very poor condition and should be replaced by concrete as early in Spring as possible to make flushing possible by the time war weather sets in. During the time repairs are going on at the lake end, new wheel blades should be provided and installed at the Flushing Plant. It would not be well to install new blades before the intake improvements are made, as the first heavy storm might drive some large plank, timber or pile into the tunnel, and again wreck all blades and nothing would be gained.

JONES ISLAND PLANT—1920

Joseph P. Rafenstein, Engineer-in-Charge.

As the experimental work of the Sewerage Commission is still under way, the centrifugal pumps were continued in operation as before; current being purchased from the T. M. E. R. L. Company. The boilers were used for heating the buildings only.

The Sewerage Commission is erecting and adding more buildings to be heated right along, and will therefore call for considerable more coal to supply their heating requirements.

STATEMENT SHOWING REFUSE DELIVERED AND DISPOSED OF AT THE CITY INCINERATOR PLANT IN 1920

MONTH	GARBAGE			ASHES			RUBBISH			MANURE			TOTAL
	tons C. C.	tons P. C.	Total	C. C. tons	P. C. tons	Total	C. C. tons	P. C. tons	Total	C. C. tons	P. C. tons	Total	Tons
January	1,981	44.61	2,025.61	.....	828.02	828.02	.....	76|37	76.37	.....	.....	.....	2,930.00
February	1,737	31.46	1,768.46	.....	822.18	822.18	.....	69.97	69.97	.....	.....	.....	2,660.61
March	2,312	61.69	2,373.69	.....	760.80	760.80	.....	85.52	85.52	.....	.....	.....	3,220.01
April	2,438	46.99	2,484.99	.....	701.73	701.73	.....	103.91	103.91	.....	.....	.....	3,290.63
May	2,476	30.67	2,506.67	.....	485.27	485.27	.....	86.23	86.23	.....	.....	.....	3,078.17
June	3,074	65.10	3,139.10	.....	504.73	504.73	.....	95.20	95.20	.....	.....	.....	3,739.03
July	3,177	26.98	3,203.98	.....	641.83	641.83	.....	114.65	114.65	.....	.....	.....	3,960.46
August	3,419	30.87	3,449.87	.....	789.86	789.86	.....	99.03	99.03	.....	.....	.....	4,338.76
September	3,967	27.45	3,994.45	.....	1,006.89	1,006.89	.....	152.33	152.33	.....	.....	.....	5,153.67
October	3,747	63.75	3,810.75	.....	724.05	724.05	.....	99.22	99.22	.....	.....	.....	4,634.02
November	2,753	54.46	2,807.46	.....	837.28	837.28	.....	238.55	238.55	.....	.....	.....	3,883.29
December	2,699	98.72	2,797.72	.....	1,026.03	1,026.03	.....	107.41	107.41	.....	.....	.....	3,931.16
TOTALS	33,780	582.75	34,362.75	.....	9,128.67	9,128.67	.....	1,328.39	1,328.39	.....	.....	.....	44,819.81

C. C.—City Collection.

P. C.—Private Collection.

ANNUAL FINANCIAL REPORT—BUREAU OF POWER PLANTS

	Incinerator Power Plant	Incinerator	Jones Island Plant	Kinnickinnic River Plant	Milwaukee River Plant	McKinley Park	Milwaukee River Dam	TOTALS
Personal Service—Perm.	$8,157.50	$115,586.04	$25,277.50	$21,855.00	$14,320.00	.....	.....	$185,196.04
Personal Service—Temp.	.....	700.80	.....	296.80	.....	$2,200.00	$249.60	3,447.20
Botanical Supplies	.....	.....	.....	.....	.....	50.20	.....	50.20
Cleaning and Dis. Supp.	.....	41.98	40.71	50.03	39.52	.93	.....	173.17
Fuel	.....	13,191.11	1,715.37	10,582.29	302.84	.....	.....	25,791.61
Office Supplies	.....	25.43	3.92	3.78	1.28	.....	.....	34.41
General Supplies	69.74	1,293.30	78.87	454.86	100.96	68.00	.....	2,065.73
Minor Apparatus	.....	16.00	9.00	.....	.....	4.34	.....	29.34
Tools	.....	89.07	14.90	5.92	.72	2.00	.....	112.61
General Materials	58.21	1,484.23	32.65	209.86	.....	610.61	.....	2,395.56
Minor Repairs	350.08	1,392.86	.....	11.78	618.22	.....	108.80	2,481.74
Municipal Garage Service	.....	122.02	.....	168.74	147.90	.....	.....	438.66
Power	.....	.....	14,376.21	.....	76.93	.....	.....	14,453.14
Team Hire	.....	.....	.....	.....	.....	689.00	.....	689.00
Telephone	.....	10.20	50.00	87.80	65.46	.....	.....	213.46
Water	.....	2,577.20	455.72	122.50	20.66	350.00	.....	3,526.08
General Service	.86	134.85	7.50	21.28	29.22	.....	.....	193.71
Insurance	.....	147.65	147.65	73.82	.....	.....	.....	369.12
Genera' Equipment	.....	546.50	.....	.....	.....	.....	.....	546.50
(Special Funds)								
Floor Repairs	.....	207.30	.....	.....	.....	.....	.....	207.30
Roof Repairs	.....	580.00	.....	.....	.....	.....	.....	580.00
Intake Repairs	.....	.....	.....	.....	6,199.88	.....	.....	6,199.88
	$8,636.39	$138,146.54	$42,210.00	$33,944.46	$21,923.59	$3,975.08	$358.40	$249,194.46
New Tile Roof	.....	3,000.00	.....	.....	.....	.....	.....	3,000.00
	$8,636.39	$141,146.54	$42,210.00	$33,944.46	$21,923.59	$3,975.08	$358.40	$252,194.46
Miscellaneous Accounts Rec.	.....	.....	25.00	.....	.....	.....	.....	25.00
	$8,636.39	$141,146.54	$42,185.00	$33,944.46	$21,923.59	$3,975.08	$358.40	$252,169.46

According to the latest inspection, the boilers are in good condition.

THOMAS McMILLAN

My most sorrowful duty is to mention the loss by death, on May 1st, 1920, of Mr. Thomas McMillan, Chief Engineer of Power Plants, who most faithfully and efficiently served the city for a period of nearly forty-six years.

Respectfully submitted,
FERDINAND KRIEGER,
Chief Engineer of Power Plants.

Report of
Bureau of Illumination Service

For the Year
1920

April 18th, 1921.

Mr. Percy Braman,
Deputy Commissioner of Public Works,
City of Milwaukee.

Dear Sir:

We are handing you herewith the report of the Bureau of Illumination Service for the year ending December 31st, 1920.

The construction work as done by contracts includes the finishing of the installation contract of 1920 and the awarding of a contract for the year 1921 which calls for the installation of 500,000 feet of cable and the erection of about 1,500 concrete posts.

The materials for the year 1921 will be bought through the Central Board of Purchases at prices which we feel will be considerably below the prices paid in 1919. We will also award an installation contract in April, 1921, which will include the remainder of the posts and cables to be installed as per the recommended system.

All of our electric and photometric laboratory equipment has been received and we are now using the same to determine the best and most efficient lamps for our use as well as the electrical testing of various natures which has come to the Bureau for their recommendation. The laboratory today is in practically the same state as it was in 1919 for the reason that the City has not elected to give us permanent quarters. We must insist that this Department be given laboratory quarters in order to fulfill the requirements of this department and if the City does not elect to allow us to remain in our present quarters which are suitable at this time, they should find means whereby we may be as suitably located.

To date we have replaced 1,743 of the old T. M. E. R. & L. Co.'s arc lamps, 2,110 old gas lamps, and 204 gasoline lamps. The rest of our units have been installed at locations where there were no lights of any kind whatsoever.

Our ability to care for lamps reported out and for patrolling our circuits have been impaired very much due to the inadequate and delapidated motor vehicle equipment that has been at our disposal for this purpose. We, therefore, recommend to you that we be authorized to buy one or more tower wagons, two or more trouble wagons. These trouble wagons are to be in service 24 hours a day. We trust that this request for motor car equipment will be granted so that we may be able to render service that is expected from this Department.

In the year 1920, we found the following:

Old Gas Lamps Out	6,654
Gasoline Lamps Out	1,296
T. M. E. R. & L. Co.'s Arcs Out	1,851
Emergency Units Out	193

This is out of 1,052 T. M. E .R. & L. Co 's arcs, 852 gas lamps, 64 gasoline lamps, and 6,100 new City Units.

The number of street units in service January 1st, 1919, was 6,100 municipally owned and operated.

There were 15 electric traffic buttons erected during the year. This we expect to be multiplied by a great deal during the year 1921.

The following is the financial report of the Bureau showing the cost of construction which is chargeable to bond as well as the cost of maintenance and operation is chargeable to the budget.

STATEMENT OF EXPENSES, RESERVES AND ABATEMENT OF EXPENSE

BUREAU OF ILLUMINATION SERVICE—Maintenance and Operation.

General Office—			
Expense		$ 16,694.15	$ 16,694.15
Laboratory—			
Expense		3,477.34	
Reserves for 1921		389.55	
Total		$ 3,866.89	
Credits			
1919 Reserves		460.02	
Net Expense			$ 3,406.87
Storehouse—			
Expense		$ 2,491.32	$ 2,491.32
Street Lighting—Operation—			
Expense		$275,324.06	
Credits			
1919 Reserves	$ 539.89		
Abatement of Expense	251.75	791.64	
Net Expense			$274,532.42
Street Lighting—Maintenance—			
Expense		$ 53,102.40	
Reserves for 1921		4,031.71	
Total		$ 57,134.11	
Credits			
1919 Reserves	$1,955.18		
Abatement of Expense	2.97	1,958.15	
Net Expense			$ 55,175.96
Construction—			
Expense		$ 6,091.96	
Credits			
1919 Reserves		1,416.00	
Net Expense			$ 4,675.96

Miscellaneous—Special Funds—			
Expense		$ 9,403.38	
Credits			
1919 Reserves	$3,135.98		
Abatement of Expense	1,489.01	4,624.99	
Net Expense			$ 4,778.39

STATEMENT OF IMPROVEMENTS IN PROGRESS

BUREAU OF ILLUMAINATION SERVICE—Electric Lighting Plant.

Jan. 1, 1921, Balance	$277,503.00	
Proceeds from Sale of Bonds	400,000.00	
Miscellaneous Revenues	8,253.94	
Total Revenue		$685,756.94
Dec. 31st, 1920, Cost of Improvements		615,627.60
Jan. 1st, 1921, Balance		$ 70,129.34

CASH BALANCE being divided as follows:

Reserves—		
Contracts	$ 47,913.11	
Purchase Orders	110.00	
Resolution	1,400.00	
Total Reserves		$ 49,423.11
UNENCUMBERED BALANCE		20,706.23
		$ 70,129.34

Compiled from records of the Comptroller's office.

Trusting this is satisfactory, we beg to remain,

Very truly yours,

BUREAU OF ILLUMINATION SERVICE,

William W. Rumsey,
Engineer Const. and Maintenance.

Howard F. Ilgner,
Illuminating Engineer.

Report of

Water Works

For the Year Ending

Dec. 31, 1920

Milwaukee Water Works

*Deputy Commissioner of Public Works

PERCY BRAMAN

Superintendent of Water Works and Water Purification

HENRY P. BOHMANN

City Engineer

GEO. F. STAAL

FERDINAND KRIEGER——Chief Engineer of Power Plants.
WILLIAM J. KUNZ——Assistant Chief Engineer of Power Plants.
WILLIAM SIEG——Engineer in Charge of North Point Pumping Sta.
WILLIAM BORMAN——Engineer in Charge of High Service Pumping Sta.
JOHN KOCH——Superintendent of Distribution.
FERD. E. FITZ——Assistant Superintendent of Distribution.
FRANK J. MURPHY——Superintendent of Meters and Services.
OSWALD J. RONGE——Chief, Division of Collections.
ARTHUR J. CONATY——Chief Accountant (General Office).
WALTER WINDFELDER——Head Bookkeeper (General Office).
GEORGE J. RODERER——Keeper of Pipe Yard.
ROBERT L. PIPER——Water Chemist.

Committee on Water Works

ALD. JOHN W. RADKE, CHAIRMAN

ALD. HERMAN O. KENT

ALD. ARTHUR SHUTKIN

ALD. HENRY BULDER

ALD. ALBERT JANICKI

*On Sept. 30, 1917, Mr. Fred G. Simmons resigned as Commissioner of Public Works. No successor being appointed, the Deputy Commissioner, under the City Charter, assumes the duties of the Commissioner of Public Works.

REPORT OF SUPERINTENDENT.

OFFICE OF SUPERINTENDENT OF WATER WORKS AND WATER PURIFICATION CITY HALL

Milwaukee, February 1, 1921.

Mr. Percy Braman,

Deputy Commissioner of Public Works.

Dear Sir:

I respectfully submit herewith the annual report of the operation of the Water Works for the calendar year ended December 31, 1920.

The following is a condensed statement of the revenues and expenditures for the year 1920:

FINANCES

Operating revenues (water only)		$1,236,842.44
Operating expenditures	$602,156.25	
Operating expenditures (Parks)	12,147.36	
Depreciation	114,512.16	
		728,815.77
		$ 508,026.67
Quasi Operating revenues	$ 71,763.79	
Quasi Operating expenditures	56,159.50	
		15,604.29
Financial revenue		227.38
Gross income from operation		$ 523,858.34
Deduction from above—Interest on bonded debt		8,775.00
Net income from operation		$ 515,083 34
Other revenues received—Water Pipe Assessment		59,793.26
Total net income from all sources		$ 574,876.60

DISPOSITION OF NET INCOME

Transfer to General City Fund	$200,000.00	
Transfer to unreserved proprietary interest	374,876.60	
		$ 574,876.60
Total amount expended for new construction work and outlays during the year 1920		844,860.53
Total proprietary interest—December 31st, 1920		10,644,270.96
Total cost of Water Works, less depreciation		10,124,593.21
Bonded indebtedness, less sinking fund on hand		180,000.00

FINANCIAL

The total operating revenues for water only were $1,236,842.44, being an increase of $104,770.17 over the previous year. This gives us a revenue of $50.51 per million gallons pumped, and is the highest revenue received under the old rate effective up to the close of the year 1920. Under this same water rate, the revenue per million gallons pumped has increased from $45.80 in 1911 to $50.51 in 1920, due to a systematic campaign for the elimination of all avoidable waste and frequent inspection and testing of large meters, etc. The total revenues of the Water Department from all sources during 1920 was $1,368,626.87.

The net income of the Department over and above operation, maintenance, depreciation and interest on bonded indebtedness was $574,876.60.

Again the sum of $200,000.00 of the net income was transferred to the General City Fund, toward reducing the general taxes, the balance used for new construction and equipment. The surplus earnings of the Water Works transferred to the General City Fund since 1892 now aggregate the sum of $3,317,965.00, which sum exceeds the sums raised by tax levy in the early years of the Water Works, before the department was self-sustaining by $1,440,426.28.

All new construction work was paid for out of the surplus earnings and depreciation cash of the Water Works. There were no bonds issued during 1920. The book value of the Water Works, less depreciation written off, is $10,124,593.21, with a bonded debt of only $180,000.00, after deducting the sinking fund on hand.

STATEMENT SHOWING ESTIMATED COST OF SUPPLYING WATER AND REVENUE RECEIVED FOR SUPPLYING WATER TO CONSUMERS DURING THE YEAR 1920

COST

Cost of operation	$614,303.61	
Interest on bonded debt	8,775.00	
Total ordinary expenditures		$ 623,078.61
Sinking fund for bonded indebtedness	15,000.00	
Depreciation	114,512.16	
*Taxes on true value of Water Works property	230,638.23	
*Interest on net invested capital at 4%	404,983.72	765,134.11
Total		$1,388,212.72

REVENUE

Total revenue for water only	$1,236,842.44
Revenue per 1000 gallons based on total pumpage	.05051

COST OF SUPPLYING WATER PER 1,000 GALLONS

Total pumpage for the year 1920—Gallons	24,485,605,320
Cost per 1000 gallons, based on total pumpage and total ordinary expenditures	$ .02545
Cost per 1000 gallons based on total pumpage and total ordinary expenditures, plus sinking fund charges, depreciation, taxes, and 4% interest on net invested capital	$ .05670

OPERATION AND MAINTENANCE

The cost of operation and maintenance for the year 1920, excluding depreciation, was $614,303.61, being an increase of $155,330.83 over the preceding year.

This unusual increase is due to several causes. First of all the salaries of all regular employes were increased $25.00 per month on January 1, 1920, with a bonus of $25.00 per month dating back to August 1, 1919, and payable in January, 1920. Wages of laborers were also increased, viz.: from 50c and 58c per hour to 60c and 85c per hour. Another reason is the extraordinary high price we were compelled to pay for coal after the expiration of the contract on July 1st, 1920. As no bids were offered the city was compelled to purchase coal in the open market on the commercial basis without a guarantee. The contract price to July 1st was $4.75 per ton. Immediately thereafter we were compelled to pay $8.50 per ton and subsequently were obliged to pay from $10.00 to $11.25 per ton. This together with the increased cost of other supplies and materials and increased pumpage of nearly two billion gallons explains the big increase in the cost of operating the Department.

The increased cost of operation is partly offset by an increase in operating revenues amounting to $104,770.17 over the previous year.

The revenue of $50.51 per million gallons pumped for the year 1920 is an increase of 40c per million gallons pumped over the preceding year and is the highest revenue under the old water rate.

*The items of taxes and interest are not actually charged on the books of the Department. The Department uses these moneys for new construction work and also transfers surplus funds annually to the General City Fund.

WATER RATES

The following metered water rates were effective during the year 1920. For water furnished inside of city a uniform rate of 4½c per 100 cubic feet or 6c per 1000 gallons, and a uniform rate of 6c per 100 cubic feet or 8c per 1000 gallons for water supplied for consumption beyond the city limits. There was no "service charge" nor a "minimum charge." Fire hydrant rental $5.00 per hydrant per year, public drinking troughs and bubblers each $50.00 per year.

On December 13, 1920, the Common Council adopted the following new schedule of water rates, effective on January 1, 1921:

SCHEDULE OF WATER RATES

Water rates are made up of two items: first, a "Service charge" against every meter to meet the cost of accounting, meter reading, delivery of bills, collection of accounts, etc.; second, a charge for water furnished to cover the cost of pumping and purifying the water, distribution, maintenance of plant, etc.

(a) SERVICE CHARGE

A uniform service charge of $2.00 per annum shall be assessed against every meter, regardless of the size of meter, service pipe or the amount of water consumed. This charge to be billed quarterly in amounts of 50c per meter and shall be payable in the same manner and at the same time when water rates are due.

(b) CHARGE FOR METERED WATER

The charges for metered water for premises inside the city limits shall be uniform, to-wit: 7 cents per 100 cubic feet, equal to 9 1-3 cents per 1000 gallons. For water furnished for any purpose beyond the city limits, there shall be a uniform charge of 10c per 100 cubic feet, equal to 13 1-3c per 1000 gallons. No deductions to be made on account of any leakage or wastage.

CLASS II

Unmetered service to Private Fire Protection System (Automatic Sprinklers):

	Connection Size 4″	6″
For the whole or fractional part of each quarterly year's service—first year, per quarter	$ 6.25	$12.50
Annually thereafter	25.00	50.00

Where the Private Fire Protection System (Automatic Sprinklers) is metered, the above connection charges shall be eliminated and in lieu thereof, an annual service charge of $2.00 per meter in addition to the charge at the established rates for water consumed shall be made.

CLASS III

Public Fire Hydrants, each	$ 10.00 per annum
Public Drinking Troughs (large), each	150.00 per annum
Public Drinking Troughs (small), each	75.00 per annum
Public Bubblers, each	50.00 per annum
Street Sprinkling and Flushing	.09⅓ per 1000 gals.

Since May 1, 1913, all services are metered, with the exception of such supplying automatic fire sprinkling systems, fire hydrants, fire cisterns, horse drinking troughs and bubblers.

Water is furnished outside of the city to the Villages of Shorewood, West Milwaukee, North Milwaukee, Whitefish Bay, the city of West Allis, County Institutions in the Town of Wauwatosa, and a number of individual consumers in the towns of Lake, Milwaukee Greenfield and Wauwatosa.

WATER SUPPLY

Lake Michigan is the source of Milwaukee's entire water supply. The intake in service at present is known as the Linnwood Avenue Intake, and consists of a concrete lined tunnel 12 feet internal diameter, and 6,553 feet in length, terminating with an octagon submerged intake crib 86 feet 7 inches long diameter, 80 feet short diameter, and 12 feet in height in 67 feet depth of water.

The lake shaft which connects the intake crib with the tunnel is 12 feet in diameter and the bottom of the lake shaft 150 feet below city datum.

The submerged timber intake crib of the tunnel is located about 5 miles from the mouth of the harbor.

The capacity of the intake is approximately 220,000,000 gallons in 24 hours at a velocity of 3 feet per second and was designed to supply not only the present North Point Pumping Station, but also a future station which will be located on the Milwaukee River near Chambers Street extended, to be known as Riverside Pumping Station. A 9 foot shore tunnel connects the intake with the North Point Pumping Station and has supplied same with water since December 23d, 1918.

On December 12th, 1919, a contract was awarded to Herman Hohensee for the construction of a 9 foot concrete tunnel approximately 7,000 feet in length, the same to extend from the shore shaft of the Linnwood Avenue Intake Tunnel, located at Lake Park, to the proposed Riverside Pumping Station on the Milwaukee River.

Approximately 47% of the work to be performed under this contract was completed on December 31st, 1920.

WATER PURIFICATION

The records of the Water Works Laboratory for the past year again indicate very wide variation in the bacterial count in both the raw and treated water. Daily bacterial analyses are made of the untreated and treated water from samples collected at 8:00 A. M., 2:00 P. M. and 10:00 P. M. As the quality of the raw water is subject to extremely wide variation within a period of a few hours, the bacterial reduction effected by the use of liquid chlorine is not as high as it would be if the quality of raw water would be more uniform. These sudden variations in the quality of the raw water emphasize the fact that our water supply is potentially dangerous. The following results were observed in the work performed in the laboratory during the past year. The number of bacteria found in 1 c.c. of untreated water incubated 48 hours at 20° C. on gelatin ranged from a minimum of 0 to a maximum of 25,800, with a mean of 695; on 20° agar incubated 48 hours from a minimum of 0 to a maximum of 31,500, with a mean of 1459; and on 37° agar incubated 24 hours from a minimum of 0 to a maximum of 21,500, with a mean of 262. In the treated water, the number of bacteria observed in 1 c.c. samples incubated 48 hours at 20° C. on gelatin, ranged from a minimum of 0 to a maximum of 14,200, with a mean of 150; on 20° agar incubated 48 hours from a minimum of 0 to a maximum of 18,000, with a mean of 264; and on 37° agar incubated 24 hours from a minimum of 0 to a maximum of 8100, with a mean of 49.

"Gas Formers" (presumptive test) were present in the untreated water in 62.8% of all 10 c.c. samples, 29.2% of all 1 c.c. samples, 11.9% of all .1 c.c. samples and 3.5% of all .01 c.c. samples examined. In the treated water "gas formers" were present in 26.8% of all 10 c.c. samples, 9.7% of all 1.c.c. samples, and 2.2% of all .1 c.c. samples examined.

The B. Coli index based on confirmed tests show the following results in the raw water: Minimum 0, Maximum 100, mean 5.68 per c.c. or 568 per 100 c.c.; in the treated or tap water, minimum 0, maximum 10, mean .46 per c.c. or 46 per 100 c.c. The United States Public Health Service has fixed a standard of purity for drinking water supplied to the public by common carriers in interstate commerce of 2 B. Coli per 100 c.c. The average bacterial reduction effected by the use of liquid chlorine based on incubation on the different media were as follows: On 20° gelatin 82.67%; on 20° agar 83.47%, and on 37° agar 82.15%. The amount of chlorine applied varied from 16 oz. to 48 oz. per million gallons of water, or from .12 to .36 parts of available chlorine per million parts of water.

The treatment of our water supply with liquid chlorine was continuous during the year and was performed under the careful supervision of the chemist of the Water Department.

The typhoid death rate of 2.2 per 100,000 of population is the lowest in the history of the city, there being 37 cases and 10 deaths reported by the Health Department.

The experimental work in filtration and other methods of water purification conducted under the direction of Mr. Jos. W. Ellms, Consulting Engineer, was completed about February 1st, 1920. A detailed report of the experimental work was made by Mr. Ellms, together with his conclusions and recommendations to the Deputy Commissioner of Public Works and by him transmitted to the Common Council for further instructions in the matter.

The conclusions and recommendations made by Mr. Ellms in his report may be briefly summarized as follows:

"As a result of the study of the detailed data set forth in this report, and from a knowledge of local conditions obtained from personal observation for a period of more than a year, certain conclusions have been reached which have been embodied in the following recommendations:

1. That in view of the present polluted condition of the City's water supply, and the probable continuance of dangerous contamination, even if the best methods now known are used to dispose of the sewage of the city, there be constructed a filtration plant of the rapid sand type, and that the project be gotten under way immediately.

2. That this filtration plant be located on the lake front near the shore shaft of the Linwood Avenue intake tunnel.

3. That on account of the increasing consumption of water by the rapid growth of the City, the filter plant be constructed to have a capacity of not less than 160 million gallons per day, based upon the usual rate of filtration for this type of plant, and that it be so designed that extensions of the plant may be made in the future.

4. That in designing the filter plant, advantage be taken of certain information gained in the experimental work, namely that adequate mixing of coagulating chemical solutions with the water may be obtained in comparatively simple devices of much less cost than those now commonly employed; that a period of sedimentation after coagulation be provided of not less than three nor more than four hours, based upon theoretical displacement; that a filter sand be used having an effective size of not less than 0.35 m.m., nor more than 0.40 m.m.; and that conduits and pipe lines be provided of such size that rates

of filtration from 15 to 20 per cent in excess of the nominal rate may be utilized.

5. That disinfection of the water after being filtered be practiced as a second line of defense against contamination; that chlorine be used for this purpose, and that the amount applied be approximately one-half that which was used on an average in treating the raw water supply of the City during 1919.

6. That no attempt be made at the present time to employ ozone as a disinfecting agent for either the raw or filtered water since the experimental evidence obtained indicated the apparatus had not been developed sufficiently to produce ozone at low enough cost to enable it to compete with chlorine as a disinfecting agent; and that the first cost of installation and the subsequent cost of operation and maintenance would be too high for use in a large municipal plant of the size required by Milwaukee."

PUMPING DIVISION

The total amount of water pumped from the lake at North Point Pumping Station during the year 1920 was 24,485,605,320 gallons, computed from the actual plunger displacement of the pumps, with no allowance for slippage. This is an average daily consumption of 66,900,560 gallons, and is an average daily increase of 5,008,957 gallons over the previous year.

The maximum pumpage for any one day was on July 29th, viz: 89,593,100 gallons, and the minimum pumpage on May 2nd, 44,586,820. The maximum rate of consumption or "peak" on the day of highest pumpage was 120,000,000 gallons in twenty-four hours.

The average daily consumption for the past five years has been as follows:

Year	Gallons
1916	54,885,366
1917	59,518,377
1918	62,598,948
1919	61,891,603
1920	66,900,560

The amount of water repumped at the High Service Pumping Station was 1,518,210,900 gallons. In addition thereto, four high service pumping engines, located at the North Point Pumping Station delivered 11,475,306,000 gallons of water direct into the high level district. The amount of water delivered in the high level district was 53.0% of the total pumpage.

The total amount of water furnished to consumers outside of the city was 3,304,589,600 gallons, or 13.49% of the total pumpage. The revenue received for water furnished outside of the city was $265,989.31, or 21.50% of the total revenue received for water.

The average head pumped against in the low service district was 161.137 feet, high service district 290.272 feet. Average head of high and low service 222.595 feet, which is an increase of 7.51 feet over the preceding year. The average duty of all engines at North Point Pumping Station was 106,632,520 foot pounds per 100 pounds of coal, and for the High Service Station 84,508,100 pounds. On account of our inability to purchase coal on the "B.T.U." basis for about six months, the station duty is somewhat lower than that of the previous year.

On November 18th an official test for duty and capacity was run of the new 20,000,000 gallon Triple Expansion Low Service Pumping Engine (designated as new No. 3) built by the Allis-Chalmers Mfg.

Co. under contract dated July 24th, 1919, for the contract price of $225,000.00. From the data of the test shown in the report of the Chief Engineer of Power Plants in this report under the Division of Pumping, it will be seen that the engine more than fulfilled all of the requirements of the specifications and the same has been accepted and the pump is now in regular service.

A contract was awarded to the W. A. Bowers Heating Co. on April 9th, for two 400 H. P. water tube boilers for the North boiler house to replace three 150 H. P. Horizontal Tubular Boilers of the North Point Pumping Station in order to increase steam capacity. These boilers will be ready for service about April 1st, 1921. Provisions have also been made in the budget for 1921 for two additional 400 H. P. water tube boilers for the North boiler house which are to replace the last three tubular boilers, giving us sufficient boiler capacity for any emergency.

Nothing but ordinary repairs were found necessary at the High Service Pumping Station. This station operates during the day hours only and is a "booster" for the high level district.

Provisions having been made for the necessary funds in the 1921 budget, there should be no delay in the construction of the proposed Riverside Pumping Station, as the present North Point Pumping Station during the period of high consumption is taxed almost to its full pumping capacity.

WATER CONSUMPTION—1920

1	Municipal Use (Gallons) 2	Industrial Use Power & Mfg. (Gallons) 3	Commerc'l Use Dwellings and Stores (Gallons) 4	Total Gallons 5	Per Cent 6
Total Metered Consumption	1,142,377,700	9,530,102,300	7,869,066,100	18,541,546,100	79.71
Estimated flat rate consumption	1,085,542,099	35,855,185	6,791,000	1,128,188,284	4.85
Unmetered free use (see details in report Supt. of Meters)	----------	----------	----------	136,130,000	.59
Under-registration of meters (Estimated at 3% of water passed through meters)	----------	----------	----------	573,449,877	2.47
"Unaccounted for"	----------	----------	----------	2,881,915,793	12.38
Totals	2,227,919,799	9,565,957,485	7,875,857,100	23,261,230,054	100.00

(Total gallons pumped based on plunger displacement of pumps, 24,485,605,320 gallons, less 5% estimated slippage of pumps = 23,261,230,054 gallons delivered into distribution mains.)

Estimated population supplied, including suburbs—500,000.

	Gallons Per Capita	Percentage of Net Pumpage
Municipal use	12.18	9.58
Industrial use	52 27	41.13
Commercial use	43.01	33.85
Under-registration of meters	3.14	2.47
Departmental free use	.75	.59
"Unaccounted for"	15.73	12.38
Totals	127.08	100.00

Gallons per capita for net pumpage	127.08
Gallons per capita for 5% slippage of pumps	6.72
Per capita of Gross Pumpage based on plunger displacement of pumps	133.80

DISTRIBUTION DIVISION

The distribution system has been extended during the past year by he laying of 30,214 lineal feet or 5.722 miles of water mains, while 95 lineal feet of pipe was abandoned, making a total length of 50.545 miles of water mains in the distribution system inside of he City at the close of the year. The laying of these mains was done nder contract, the department furnishing the pipe, specials and ydrants.

There were 61 new hydrants set and 4 hydrants cut out, leaving a total of 3828 hydrants in service. Gate valves to the number of 82 were set during the year and one valve cut out, giving us a total of 1540 at the end of the year.

A total of 1451 tap and branch connections were made during he past year, of which number 938 were improvement taps and extended to curb only. This gives us a total of 87,007 tap and 2393 branch connections made to date. Of this number 67,719 are active taps and 21,681 extended to curb only, or turned off at either curb or at the main and not in actual use.

The concrete water pipe tunnel across the Menomonee River from West Water Street to Reed Street carrying a 24 inch feeder main was completed by Herman Hohensee under contract dated May 7th, 1919. This tunnel takes the place of the pipe laid in the bed of the river at Third Street extended which was damaged beyond repair and therefore abandoned.

A concrete tunnel 7½ feet in diameter crossing the canal at Muskego Avenue was also completed during the year and carries not only a 24 inch water main but also a sewage pipe 18 inches in diameter. This tunnel was built by the Sewerage Commission and the cost of same divided between the two departments. All that remains to be done is to connect the 16 inch pipe in Muskego Avenue with the vertical risers in the two shafts.

A total of 22 breaks in water mains occurred during the year of which 6 were due to electrolysis.

A detailed report of the work performed by this division is given in the report of the Superintendent of Distribution.

KILBOURN PARK RESERVOIR

The reservoir located in Kilbourn Park is not a storage reservoir, but rather an "equalizing reservoir" which equalizes the water pressure in the low service district and also serves as a source of supply for the High Service Pumping Station, located on North Avenue, between 10th and 11th Streets. The average width of the reservoir is 310 feet; average length 515 feet. The depth of the water in the reservoir, when filled, is 21.5 feet and the elevation of the water at this height is 150 feet above city datum. The capacity of the reservoir is 21,000,000 gallons.

The park connected with the reservoir was kept in the usual attractive condition. There were seven band concerts given during the months of July and August, and the cost amounting to $875.00 was paid for out of the water fund.

The following table indicates the depth of water maintained in the reservoir each month during the past year:

Month	Highest	Lowest	Mean
January	21.60	18.00	20.50
February	21.60	16.60	20.36
March	21.60	17.50	20.19
April	21.70	16.90	20.34
May	21.60	16.70	20.12
June	21.60	17.80	20.50
July	21.70	17.90	20.68
August	21.70	18.30	19.99
September	21.70	16.20	20.39
October	21.90	19.20	20.88
November	21.70	17.40	20.51
December	21.80	17.00	20.30
Highest during year	21.90		
Lowest during year		16.20	
Average Mean			20.40

METER DIVISION

The total number of new meter installations during the year was 1667. There were 380 meters taken off on account of removal of buildings or replacements with new meters, etc., leaving a net gain of 1285 meters for the year and a grand total of 67,056 meters in service on December 31, 1920. A total of 14,958 meters were repaired, of which number 8,985 were repaired in the shop and 5,973 were repaired on the premises.

The new meter shop being erected on Market Street, between Johnson and Martin Streets, will be ready for occupancy about the middle of March, 1921.

For more complete details of the operation of this Division, see report of the Superintendent of Meters.

COLLECTION DIVISION

This division is responsible for the reading of meters and the assessment and collection of some 67,000 customers' accounts. An audit was made by the City Comptroller of the books and accounts of this division who reports that all assessments were correctly made and that all moneys were properly deposited with the City Treasurer as provided by law.

CONCLUSION

To the Heads in charge of the several divisions of the Water Works, and to the employes under them, I take this opportunity of expressing my appreciation for the faithful and efficient service rendered to the department during the past year.

Respectfully submitted,

H. P. BOHMANN,

Supt. Water Works and
Water Purification.

SUMMARY OF STATISTICS FOR THE YEAR ENDED DECEMBER 31, 1920

In form recommended by the New England Water Works Association.

MILWAUKEE WATER WORKS
Milwaukee, Milwaukee County, Wisconsin.

GENERAL STATISTICS

Population by census of 1920—457,174. Present population estimated at 465,000.
Date of original construction—1872-1874.
By whom owned—City of Milwaukee.
Mode of supply (whether gravity or pumping)—Pumping.

PUMPING STATISTICS

1. Builders of pumping machinery—Edward P. Allis Co., Allis-Chalmers Mfg. Co., Wisconsin Engine Co.

2. Description of fuel used:
   (a) Kind—bituminous.
   (b) Brand of coal—Youghiogheny screenings and West Virginia Splint screenings.
   (c) Price of coal per ton of 2,000 lbs., delivered by truck to Pumping Station:
   North Point Station:

Youghiogheny screenings	$4.75 to $10.00
Pocahontas screenings	9.50 to 11.00
Pittsburgh screenings	9.25

   High Service Station:

Youghiogheny screenings	4.95 to 10.25
West Virginia splint screenings	9.75 to 10.00
Pocahontas screenings	9.75 to 11.25

   (d) Percentage of ash of coal consumed at North Point Pumping Station—17.08.
   (e) Percentage of ash of coal consumed at High Service Pumping Station—14.58.
   (f) Wood, price per cord—none used.

3. Coal consumed:
   (a) North Point Pumping Station (for all purposes)—42,923,650 lbs.
   (b) North Point Pumping Station (while pumping)—42,628,750 lbs.
   (c) High Service Pumping Station (for all purposes)—2,244,400 lbs.
   (d) High Service Pumping Station (while pumping)—1,853,400 lbs.

4. Pounds of wood consumed ÷ 3 = equivalent amount of coal—none.
   (a) Amount of other fuel used—none.

5. Total equivalent coal consumed for the year (4) lbs.—none.

6. Total pumpage for the year:
   (a) North Point Pumping Station (where all direct pumpage from the lake is done)—24,485,605,320 gallons.
   (b) High Service Pumping Station (where the water is re-pumped from the reservoir into the High Service District)—1,518,210,900 gallons.

7. Average static head against which pumps work (North Point Pumping Station low service)—150 feet.

8. Average dynamic head against which pumps work:
   (a) North Point Pumping Station, low service 161.137; high service 290.272. Average of high and low service—222.595 feet.
   (b) High Service Pumping Station 123.7 feet + suction head 9 586 feet + 128.30 feet elevation of gauge = 261.586 feet above datum.

9. Number of gallons pumped per pound of equivalent coal (5)—none.

10. Duty = $\left\{ \dfrac{\text{Gals. pumped (6.A) x 8.34 (lbs.) x 100 x dynamic head (8.A)}}{\text{Total fuel consumed while pumping at North Point Pumping Station (3B)}} \right.$ = 106,632,520 lbs.

11. Cost of pumping figured on pumping station expenses, viz: North Point Pumping Station $270,218.30; High Service Pumping Station $28,-922.33.
   (a) Per million gallons pumped at North Point Pumping Station—$11.03.
   (b) Per million gallons re-pumped at High Service Pumping Station—$19.05 + 11.03 = $30.08.

12. Per million gallons raised one foot (dynamic).
   (a) North Point Pumping Station—$0.0495.
   (b) High Service Pumping Station—$0.1429.

STATISTICS OF CONSUMPTION OF WATER

1. Estimated total population at date (city only)----------465,000
2. Estimated population on lines of pipe (city only)----------465,000
3. Estimated population supplied (includes suburbs)----------500,000
*4. Total consumption for the year----------24,485,605,320 gallons
5. Passed through meters----------18,541,546,100 gallons
6. Percentage of consumption metered---------- 75.72
7. Average daily consumption----------66,900,560 gallons
8. Gallons per day to each inhabitant (1) after deducting water furnished outside of city ----------124.4 gallons
*9. Gallons per day to each inhabitant, including population supplied outside of city (3)----------133.8 gallons
*10. Gallons per day to each tap----------988. gallons
   (This is figured on taps in actual use, of which number 67,056 are metered, 182 elevator indicators and 481 unmetered).
   (The latter consists of 239 Automatic Fire Sprinkler Systems, Public Drinking Troughs, Bubblers, etc.)
11. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation ($728,815.77) —$29.76.
12. Cost of supplying water per million gallons, figured on total operating and maintenance expenditures, including depreciation, plus interest on bonds—$30.12.

---

*No deduction for slippage, estimated at 5%.

STATISTICS RELATING TO DISTRIBUTION SYSTEM MAINS

1. Kind of pipe—Cast iron.
2. Sizes from 4 to 42 inch.
3. Extended 30,214 lineal feet; 5.722 miles.
4. Discontinued lineal feet — 795; .150 miles.
5. Total now in use—550.545 miles.
6. Cost of repairs per mile, including valves and boxes—$18.18.
7. Number of leaks per mile—.18.
8. Length of pipe less than 4 inches in diameter—None.
9. Number of hydrants added during the year—61—4 cut out.
10. Number of hydrants now in use—3,828.
11. Number of stop gates added during the year—82—1 cut out.
12. Number of stop gates now in use—4,540.
13. Number of stop gates smaller than 4 inch—1.
    (In addition to the above gates, there are 2,393 gates from 2 inches to 8 inches, controlling branch connections).
14. Number of blow-offs—63.
15. Range of pressure on mains—20 to 90 pounds.

16, 17, 18, 19, 20, 23, 24. All services put in by consumer.

21. Number of services (taps and branches) added during the year—1,451.
22. Number of services connected to mains—87,007 taps and 2,393 branches, a total of 89,400.
25. Number of new meters added during the year—1,667.
26. Number of meters now in use—67,056, after deducting 380 meters permanently off.
*27. Percentage of services metered—99.
28. Percentage of receipts from metered water—35.6.
29. Number of motors and elevators added—None; 5 taken out.
30. Number now in use—182.

UNIVERSITY OF ILLINOIS LIBRARY
APR 23 19..

*Figured on services in actual use, of which 67,056 are metered, 182 elevator indicators and 481 unmetered. The latter consists of 239 Automatic Fire Sprinkler Systems, Public Drinking Troughs, Bubblers, etc.

NOTE—A more complete report of the Water Works is published under separate cover, givingg the detailed activities of each division of the Water Works, which report may be had on request.

UNIVERSITY OF ILLINOIS-URBANA
3 0112 117712759